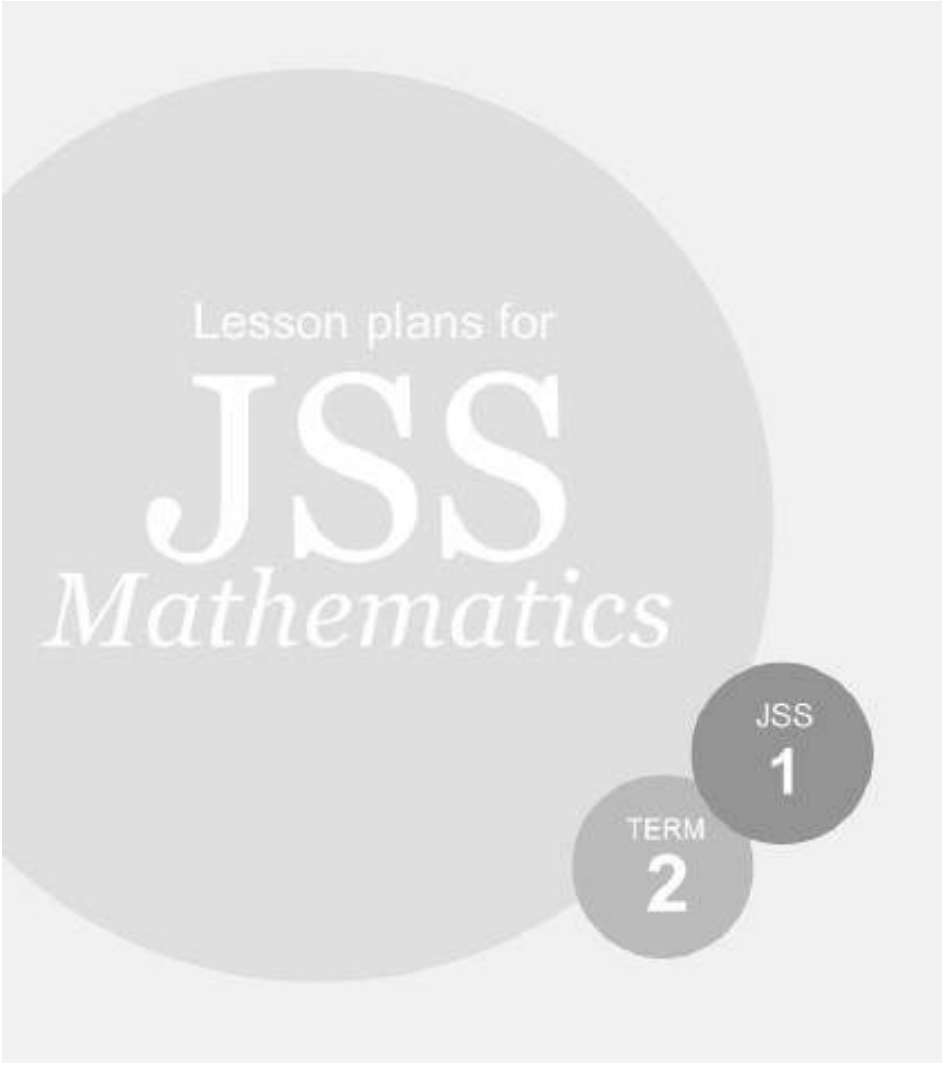
JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2



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LIST OF JSS1 MATHEMATICS TERM 2 TOPICS

JSS2 Term 2	JSS1 resources for JSS2
Lessons 46 – 55 (JSS2 PHB) Direct and indirect proportion	**TERM 2, TOPIC PROGRESS CHART 1, 2 & 6** **Lesson 46 – 55, 66** (JSS1 PHB)
Lessons 56 – 58 (JSS2 PHB) Personal expenditure, income tax, sales tax	**TERM 2, TOPIC PROGRESS CHART 7** **Lessons 67 to 70** (JSS1 PHB)
Lessons 59 – 60 (JSS2 PHB) Time and duration; Problem solving with time	*Not covered in JSS1*
Lessons 61 – 64 (JSS2 PHB) Perimeter and area of rectangles, squares, parallelograms, trapeziums and triangles	**TERM 2, TOPIC PROGRESS CHART 8, 9, 10** **Lessons 71 to 80** (JSS1 PHB)
Lessons 65 – 67 (JSS2 PHB) Perimeter and area of circles, composite shapes	**TERM 2, TOPIC PROGRESS CHART 11** **Lessons 81 to 85** (JSS1 PHB)
Lessons 68 – 74 (JSS2 PHB) Volume of solids, cubes, rectangular prisms, triangular prisms, cylinders, composite solids Volume story problems	**TERM 2, TOPIC PROGRESS CHART 12** **Lessons 86 to 90 (**JSS1 PHB) Topic progress chart 12: Volume of solids
Lessons 75 – 79 (JSS2 PHB) Surface area of solids, cubes, rectangular prisms, cylinders, composite solids Surface area story problems	*Not covered in JSS1*
Lessons 81 – 90 (JSS2 PHB) Angles, measuring angles, Finding unknown angles in triangles and quadrilaterals Sum of interior angles of a pentagon, a polygon; story problems	**TERM 2, TOPIC PROGRESS CHART 13, 14 & 15** **Lessons 91 to 100 (**JSS1 PHB)
Lessons 91 – 98 (JSS2 PHB) Transformations: translation, reflection, rotation; Line symmetry, rotational symmetry; Enlargement Combining transformations	*Not covered in JSS1*
Lessons 99 – 100 (JSS2 PHB) Scale factor	*Not covered in JSS1*
Lessons 101 – 105 (JSS2 PHB) Arithmetic patterns and geometric patterns	**TERM 3, TOPIC PROGRESS CHART 1** **Number patterns** Lessons 106 to 108 **(**JSS1 PHB

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Topic 1: Ratio M-07-046 to M-07-050 p2 – 11

Check that you can	**Do you understand these words?**
* work with fractions, decimals and percentages	ratio; quantities; part-to-part; part-to-whole; express ratio as fraction/percent/decimal

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 2 – 9.

CONCEPTS:

* A **ratio** compares two quantities of the same kind or units (for example, people, cups, kilometres)

* The **order** of a ratio is important.

Example:

A ratio of 3 cups of milk to every 2 cups of flour in a recipe can be written as **3 : 2**

2 cups of flour to every 3 cups of milk is a ratio of 2 to 3, written as **2 : 3.**

* A ratio can compare two parts of a whole or compare a part to the whole.

Example:

10 mangoes and 8 pineapples in a fruit basket -

Mangoes : Pineapples = **10 : 8 = 5 : 4**

All fruit : Mangoes = **18 : 10 = 9 : 5**

Pineapples : All fruit = **8 : 18 = 4 : 9**

* We can also write ratios as **fractions**:

Example:

$\frac{\text{mangoes}}{\text{pineapples}} = \frac{10}{8} = \frac{5}{4}$ or $\frac{\text{mangoes}}{\text{all fruit}} = \frac{10}{18} = \frac{5}{9}$

* **Percentage** is a ratio that compares a number to 100.

Example:

25% = 25 : 100

* To express a ratio as a percent, express the ratio as a fraction and then multiply the fraction by 100

Example:

$2 : 5 = \frac{2}{5} = \frac{2}{5} \times \frac{20}{20} = \frac{40}{100} = 40\%$

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 1: Ratio

Exercise

1. Binta has 5 pencils and 6 pens. Write down:
   a. The ratio of **pencils** to **pens** in three forms. b. The ratio of **pens** to **pencils.**
2. A farmer has some animals on his farm. These include 16 chickens, 13 goats, 12 cows and 21 sheep. Write down and simplify the ratio of:
   a. cows to goats to chickens to sheep b. sheep to cows to chickens to goats
   c. chickens to all animals d. sheep to all animals on the farm
3. Sahr went to her garden and picked 25 fruit. She counted 15 mangoes, 12 pineapples and the rest were oranges. Write down and simplify the ratio of:
   a. mangoes to pineapples to oranges b. The ratio of mangoes to all fruit
   c. The ratio of pineapples to all fruit d. The ratio of oranges to all fruit
4. Express the ratio of 36 girls to 24 boys as a fraction in its lowest term.
5. Mabinty bought 40 fruits from the market. 32 are oranges and the rest are mangoes. Write the following as fractions and simplify:
   a. the ratio of mangoes to oranges b. the ratio of mangoes to all of Mabinty's fruit
   c. the ratio of oranges to all of Mabinty's fruit
6. Express 75 rabbits to 600 mice as a fraction in its lowest term.
7. Hawa got these marks in the following subject in the last examination:
   Mathematics 65%, Science 72% and History 40%.
   Express Hawa's mark for each subject as a ratio.
   Change the ratios for Hawa's marks to fractions in their lowest terms.
8. Express these percent as ratios: a. 55% b. 70% c. 75%
9. Express these ratios as percent: a. 7 : 25 b. 36 : 40
10. Express a. 7 days : 28 days as a decimal. b. Express 300 cm : 500 cm as a decimal.
12. Express 350 m : 1000 m. as a fraction, decimal, and percentage.

Check your answers:

1a. pencils : pens = 5 : 6 5 is to 6
For every 5 pencils, there are 6 pens.
b. pens : pencils = 6 : 5
2a. cows : goats : chickens : sheep
= 12 : 13 : 16 : 21
b. sheep : cows : chickens : goats
= 21 : 12 : 16 : 13
c. chickens : all animals = 16 : 60 = 4 : 15
d. sheep : all animals = 21 : 60 = 7 : 20
3a. mangoes : pineapples : oranges = 15 : 12 : 8
b. mangoes : all fruit = 15 : 25 = 3 : 5
c. pineapples : all fruit = 12 : 25
d. oranges : all fruit = 8 : 25
4. girls : boys = 36 : 24 = 3 : 2
5a. mangoes : oranges = 8 : 32
b. mangoes : fruit = 8 : 40 = 1 : 5
c. oranges : fruit = 32 : 40 = 4 : 5
6. rabbits : mice = 75 : 600 = 3 : 24 = 1 : 8
7. Mathematics 65 : 100 = $\frac{65}{100} = \frac{13}{20}$
Science 72 : 100 = $\frac{72}{100} = \frac{18}{25}$
History 40 : 100 = $\frac{40}{100} = \frac{2}{5}$
8a. 55 : 100 = 11 : 20 b. 70 : 100 = 7 : 10
c. 75 : 100 = 3 : 4
9a. 28 : 100 = 28% b. 18 : 20 = 90 : 100 = 90%
10. 7 : 28 = 1 : 4 = 0.25 11. 3 : 5 = 0.60
12. 35 : 100 = 0.35 = 35% and 7 : 20 = $\frac{7}{20}$

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 2: Ratio applications M-07-051 to M-07-055 p12 – 23

Check that you can
* work with ratio as a fraction, percent or decimal

Do you understand these words?
equivalent ratios;
share quantities in a given ratio

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 10 – 18.

CONCEPTS:

* To simplify a ratio, divide by the HCF

12 : 30 = $\frac{12}{6}$: $\frac{30}{6}$ = 2 : 5

So 12 : 30 and 2 : 5 are equivalent ratios

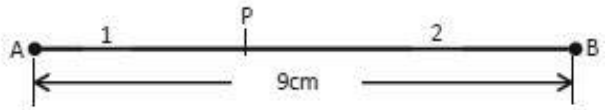
* Divide (share) 20 mangoes in ratio 2 : 3.

There are 5 parts/shares. $\frac{2}{5} \times 20 = 8$ and $\frac{3}{5} \times 20 = 12$

* Divide 90 oranges among 4 friends in the ratio

3 : 4 : 2 : 6. 15 parts, so $\frac{3}{15} \times 30 = 6$

* We can compare lengths or distances using ratio.



P divides the line AB in the ratio 1 : 2. So AP : PB = 1 : 2

There are 3 parts, so AP = $\frac{1}{3} \times 9 = 3\text{cm}$;

PB = $\frac{2}{3} \times 9 = 6\text{cm}$

CONCEPTS:

* What is the result of sharing Le 14,000 so that Adama has 3 parts and Marie has 4 parts?

Adama : Marie = 3 : 4 total of 7 parts.

Adama gets $\frac{3}{7} \times 14{,}000 = Le\ 6{,}000$

Marie gets $\frac{4}{7} \times 14{,}000 = Le\ 8{,}000$

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 2: Ratio applications

Exercise

1. To make a cooldrink I must mix concentrate with water in a ratio of 1 : 3.
   a. If I have 400 ml of concentrate, how much water must I use?
   b. If I want to make 8 litres of cooldrink, how much concentrate must I use?
   c. If I want to make 1 litre of cooldrink, how much concentrate must I use?
2. Share Le 18 000 between the people in the ratio shown:
   a. Sorie's share : Issa's share = 1 : 5
   b. Tamba's share : Aiah's share = 5 : 7
   c. Lamin's share : Esther's share : Kona's share = 1 : 2 : 3
3. A recipe to make 30 biscuits uses 2 eggs.
   a. How many eggs will I need to make 120 biscuits?
   b. If I have 7 eggs, how many biscuits can I make?
4. I travel at 80 km per hour. How long will it take me to travel
   a. 400 km? b. 600 km?

   How far will I have travelled in
   c. 4½ hours? d. 12 minutes?

Check your answers:

1a. 1 : 3 = 400 : 1 200. 1200 litres

b. concentrate : cooldrink = 1 : 4 = **2** : 8
I need 2 litres of concentrate.

c. 1 litre = 1000 ml
concentrate : cooldrink = 1 : 4
= 250 : 1000 I must use 250 ml.

2a. 1 : 5 so there are 6 parts. Each part is Le 3000.
Sorie gets 1 × 3000 = Le 3000
Issa gets 5 × 3000 = Le 15 000

b. 5 : 7 so there are 12 parts. Each part is Le 1500.
Tamba gets 5 × 1500 = Le 7500
Aiah gets 7 × 1500 = Le 10 500

c. There are 6 parts. Each is 3000. Lamin, Le 3000.
Esther, Le 6000 and Kona, Le 9000.

3a. 2 eggs for 30 biscuits. 8 eggs for 120 biscuits.

b. 1 egg for 15 biscuits. 7 eggs for 105 biscuits.

4a. 5 hours b. 600 ÷ 80 = 7½ hours

c. 80 × 4,5 = 360 km

d. 12 min = $\frac{12}{60}$ hours = 0.2 0.2 × 80 = 40 km

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 3: Integers M-07-056 to M-07-058 p24 – 32

Check that you:
* know that the positive whole numbers, zero and the negative whole numbers are all called integers

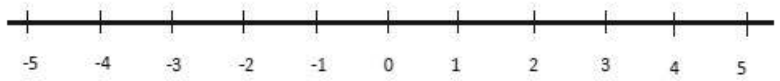
Do you understand these words?
integers; positive & negative numbers; temperature; metres above/below sea level; degrees below zero Celsius; greater than (>), less than (<)

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 19 - 25.

CONCEPTS:

* Numbers less than zero are called negative numbers
* Negative numbers can be used to describe:
  - money owed
  - steps backwards on a number line,
  - temperatures below 0°C
  - metres below sea level.

* The number line shows negative numbers, zero and positive numbers:



* Negative numbers are always written with the – sign.
  Sometimes the + is not written before positive numbers.
* Numbers to the right on a number line are bigger than numbers to the left.
  The farther positive integers are to the right of zero, the greater their value, so 10 > 5
  The farther negative integers are to the left of zero, the lesser the value, –10 < –5.
  Zero is greater than negative numbers (0 > –5) and smaller than positive numbers (0 < 5)

Examples:

Arrange 4, –2 , –5 , 3, –1 in ascending order (from least to most)

–5, –2, –1, 3, 4.

Arrange 31, –31 , –15 , 30, 0, –5 in descending order (from most to least)

31, 30, 0, –5 , –15, –31

Ready to work with pupils.

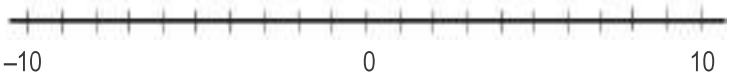
JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 3: Integers

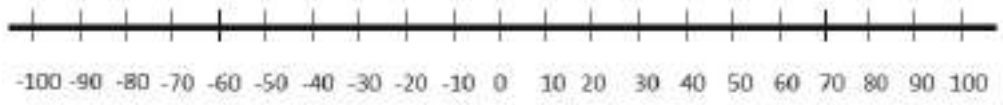
Exercise

1. 

   a. Place the following numbers on the number line: –7, 7, –3, 4, –1, 2

   b. Which number is bigger?

   –7 or –3 –1 or 2 –1 or –3

2. 

   Use the number line to complete the following with > or <:

   a. 0 ____ –10 b. –10 ____ –20 c. –20 ____ 10 d. –90 ____ –100

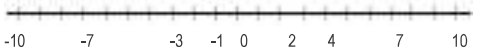
   e. 0 ____ 10 f. –50 ____ 0 g. 70 ____ 20 h. –60 ____ –30

3. List these integers in order from greatest to least: –3, 4, 11, –4, –11, 2

4. List these integers in order from least to greatest: 25, –30, 40, –40, –25, –10, 10.

5. The bigger positive integers are, the _____ their value.
   The bigger negative integers are the _____ their value.

Check your answers:

1. 

   b. –3 is bigger than –7 2 is bigger than –1
   –1 is bigger than –3

2a. 0 > –10 b. –10 > –20

   c. –20 < 10 d. –90 > –100

   e. 0 < 10 f. –50 < 0

   g. 70 > 20 h. –60 < –30

3. 11, 4, 2, –3, –4, –11

4. –40, –30, –25, –10, 10, 25, 40

5. The bigger positive integers are, the greater/more their value.
   The bigger negative integers are the lesser their value.

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Topic 4: Adding and subtracting integers M-07-059 to M-07-061 p33 – 41

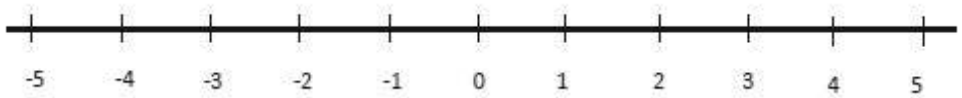
Check that you know that:
* the positive whole numbers, zero and the negative numbers are all called integers

VOCABULARY:
No new vocabulary

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 26 – 31.

CONCEPTS:

* A number line helps us to add and subtract integers.



(+) + (+) = +

(−) + (−) = −

(+) + (−) = − or +

* Find the first integer on the number line.

* To add a positive integer, move to the right.

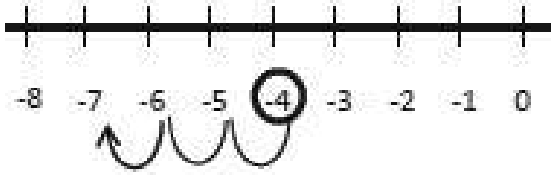
* To subtract a positive integer, move to the left.

* To add a negative integer, move to the left.

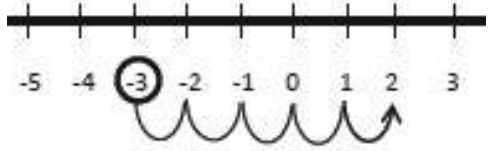
* To subtract a negative integer, move to the right.

Examples:

$-4+(-3) = -7$ or $-4-3 = -7$



$-3+(+5) = +2$ or $-3+5 = +2$



$+4-(+6) = 4-6 = -2$

$-8-(-9) = -8+9 = +1$

** Hint: Keep a number line in your mind, even if you don't draw one!*

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

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Topic 4: Adding and subtracting integers

Exercise

Calculate:

1a.	8 – 10	b. 5 – 12	c. – 8 – 3
2a.	– 5 – 2	b. – 7 + 3	c. – 8 + 10
3a.	6 – (–3)	b. 8 + (–12)	c. 12 – (–2)
4a.	9 + (–3)	b. 12 – (–4)	c. 39 + (–4)
5a.	240 – (–45)	b. –36 – 42	c. –124 + 235
6a.	23 – 46	b. 36 – 58	c. 3 – 5 + 7
7a.	– 12 – 15	b. –32 + 14	c. –5 – 2 + 7
8a.	26 + (–14)	b. 28 + (–32)	c. –23 + 27 – (–4)
9a.	48 – (–3)	b. –12 – (–15)	c. 2 + (–10) – 24
10a.	–14 + (–27)	b. 143 – 189	

11. Complete the following calculations

a. ☐ + (–3) = 12 b. 15 + ☐ = 6 c. 15 – ☐ = 6 d. ☐– (–7) = –1

e. ☐– (–5) = 9 f. 235 + ☐ = 189

12. You may only use the following numbers to answer the questions:

–7; –5; –2; 2; 5; 7.

a. Use two of the numbers to make the largest possible result. ☐ + ☐ =

b. Use two of the numbers to make the smallest possible result. ☐ + ☐ =

c. Use two of the numbers to make the largest possible result. ☐ – ☐ =

d. Use two of the numbers to make the smallest possible result. ☐ – ☐ =

13. The temperature in Freetown was 17°C at 6 pm in the evening. By 6 am the next morning, it had dropped by 2°C. By noon it had risen to 28° C.
How many degrees warmer was it at noon than at 6 pm the day before?

Check your answers:

1a.	–2	b. –7	c. –11
2a.	–7	b. –4	c. 2
3a.	9	b. –4	c. 14
4a.	6	b. 16	c. 35
5a.	285	b. –78	c. 111
6a.	–23	b. –22	c. 5
7a.	–27	b. –18	c. 0
8a.	12	b. –4	c. 8
9a.	51	b. 3	c. –32
10a.	–41	b. 46	
11a.	15	b. –9	c. 9
	d. –8	e. 4	f. –46

12a. 5 + 7 = 12

b. –7 –5 = –12

c. 7 – (–7) = 14

d. –7 – 7 = –14

13. 11°C

JSS1 Mathematics Topic Progress Chart

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Topic 5: Multiplying and dividing integers M-07-062 to M-07-065 p42 – 51

* **Check that you know that:** the positive whole numbers, zero and the negative numbers are all called integers	**VOCABULARY:** No new vocabulary	*Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 30 – 31.*

* If the two integers have the same sign, their product is positive.
* If the two integers have different signs, their product is negative.

Remember:

positive × positive = positive
positive × negative = negative
negative × positive = negative
negative × negative = positive

positive ÷ positive = positive
positive ÷ negative = negative
negative ÷ positive = negative
negative ÷ negative = positive

Examples:

(−100) × (−3) = +300 100 × 3 = +300

(−49) ÷ 7 = −7 (49) ÷ −7 = −7

CONCEPTS:

Problem solving with integers:

To solve problems with integers, we use problem solving steps:

1. Read the problem to understand the context and to find clue words for add, subtract, multiply, divide.
2. Represent the problem with a diagram if you can.
3. Identify the operations you need to use.
4. Write a number sentence for the problem.
5. Solve the problem.

Example:

Mohamed is a certain age. He is 4 years older than Finda and Finda is one third of David's age. If David is 30 years old, how old is Mohamed?

Let Mohamed by x years old. Then Finda is x – 4.

So $x - 4 = \frac{1}{3} \times 30$

x = 10 + 4 = 14. David is 14 years old.

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

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Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 5: Multiplying and dividing integers

Exercise

Calculate:

1a. $\square - (-72) = -64$ b. $145 - \square = 136$ c. $\square + (-13) = 22$

2a. $\square \times (-5) = 15$ b. $2 \times \square = 10$ c. $7 \times \square = 21$

3a. $\square \times 4 = -12$ b. $-120 \div \square = 20$ c. $\square \times -12 = 84$

For questions 4 to 6, test different integers until you find one that works!

4. Two numbers have a sum of –6 and a product of –16. What are the two numbers?

5. Two numbers have a sum of –17 and a product of 72. What are the two numbers?

6. Two numbers have a quotient of 3 and a product of 12. Give all possible values for the two numbers.

7. If it is 25°C in Freetown and –2°C in Johannesburg, what is the temperature difference between the two cities?

8. David didn't have money, but he earned 50,000 Leones.
However, he owes 2 different people 35,000 Leones each and needs to pay them.
What is the balance of David's money?

9. Finda has borrowed 600,000 Leones. She has 6 children.
She bought each of her children shoes on credit. Each pair of shoes cost 90,000 Leones.
What is the balance of her money?

10. A bird is flying 12m above the sea and a fish is directly below the bird −14m under the sea.
What is the distance between the bird and fish?

11. The air temperature is 33°C and a box of frozen fish is –4°C.
What is the difference in temperature between the air and the frozen fish?

Check your answers:

1a. $\square + 72 = -64$ $\square = -136$

b. $145 - \square = 136$ $\square = 9$

c. $\square = 35$

2a. $\square = -3$ b. $\square = 5$ c. $\square = 3$

3a. $\square = -3$ b. $\square = -6$ c. $\square = -7$

4. Two numbers are 2 and –8.
$2 + (-8) = -6$ and $2 \times -8 = -16$

5. Two numbers are –8 and –9.
$-9 + (-8) = -17$ and $-9 \times -8 = 72$

6. Two numbers are 2 and 6, or –2 and –6
$6 \div 2 = 3$ and $6 \times 2 = 12$
$-6 \div -2 = 3$ and $-6 \times -2 = 12$

7. 25°C – (–2°C) = 27°C

8. Le 50,000 – 2 × 35,000
= 50,000 – 70,000 = –20,000

9. 6 × 90,000 = Le 540,000
She has Le 60,000 left.

10. 12 – (–14) = 26 m
between the fish and the bird.

11. 33°C – (–4°C) = 37°C difference

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 6: Proportion M-07-066 p52 – 54

Check that you can:	**VOCABULARY:**	*Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 38 – 55.*
* use percentage, rate and ratio * calculate with money	simple proportion.	

CONCEPTS:

* A **proportion** is two ratios that are equivalent or equal. They are measured in the same units.

Example:

The cost of 10 chairs is *Le*80. Find the cost of 15 chairs. Write a proportion to find the cost.

$$\frac{10\ chairs}{Le\ 80} = \frac{15\ chairs}{?}$$

Method 1 Find the cost of 1 chair first

If 10 chairs cost Le 80,

then 1 chair costs $\frac{80}{10} = Le\ 8$.

So 15 chairs cost Le 8 $\times$15 = Le 120

Method 2 What number do we need to multiply by on both sides?

10 : 15

$\times 8$ ( ) $\times 8$

80 : ?

15 $\times$ 8 = 120

Method 3 Cross multiplication

$$\frac{10\ chairs}{Le\ 80} = \frac{15\ chairs}{?}$$

10 $\times$? = 80 $\times$ 15

? = $\frac{80 \times 15}{10} = 120$

Important: Cross multiplication can only be used for two equivalent fractions (across the equals sign)

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 6: Proportion

Exercise

1. 7 packets of candle cost Le 980.
   a. How many packets can be bought with Le 4480?
   b. What is the cost of 50 packets of candles?

2. Aiah ran 100 meters in 15 seconds.
   a. How long will she take to run 400 meters if she runs at the same speed?
   b. How many metres will she cover in 10 seconds, running at the same speed?

3. Beef is sold for Le 2 800 for 100 grams.
   a. What is the cost of 4 kilograms at this price?
   b. What is the cost of ½ kilogram of beef?
   c. How much beef can I buy with Le 70 000?

4. Finda travelled 532 km in 5 hours, Mabel travelled 393 km in 3 hours and Alice travelled 200 km in 2 hours. Who travelled fastest?

5. I buy 8 "king drivers" for Le 4000.
   a. How much will 10 of the same "king drivers" cost?
   b. How many "king drivers" can I buy Le 6000?

Check your answers:

1a. $\frac{7 \text{ packets of candles}}{x} = \frac{Le\ 980}{Le\ 4480}$

$$x = \frac{7 \times 4480}{980} = 32$$

32 packets of candles can be bought.

b. $\frac{7 \text{ packets of candles}}{50 \text{ packets of candles}} = \frac{Le\ 980}{x}$

$$x = \frac{980 \times 50}{7} = 7000$$

50 packets of candles will cost Le 7000.

2a. $\frac{100 \text{ metres}}{400 \text{ metres}} = \frac{15 \text{ seconds}}{x}$

$$x = \frac{15 \times 400}{100} = 60 \text{ seconds}$$

She can run 400 m in 60 seconds.

b. $\frac{100 \text{ metres}}{x \text{ metres}} = \frac{15 \text{ seconds}}{10 \text{ seconds}}$

$$x = \frac{10 \times 100}{15} = 66.7 \text{ metres}$$

She can run 66.7 m in 10 seconds.

3. Le 2 800 for 100 grams.
   1 kg will cost Le 28 000.
   a. 4 × 28 000 = Le 112 000
   b. ½ kg = 5 × 100 g
   2 800 × 5 = Le 14 000

4. 532 km ÷ 5 hours = 106.4 km per hour.
   393 ÷ 3 hours = 131 km per hour.
   200 ÷ 2 hours = 100 km per hour.
   Mabel is fastest.

5. a. 8 cost Le 4000. 1 costs Le 500.
   So 10 cost Le 5000
   b. 6000 ÷ 500 = 12
   I can buy 12 "king drivers".

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 7: Finances M-07-067 to M-07-070 p55 – 66

Check that you can:
* use percentage, rate, ratio and proportion
* calculate with money

VOCABULARY:
simple interest; interest rate; per annum; principal amount; borrow; lend; invest, investment.; discount; commission; sales tax

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 56 – 62.

CONCEPTS:

Interest: Extra money that is charged or paid on money you have borrowed or invested.

*** Simple Interest:**

Interest charged or earned on the initial amount borrowed or invested.

$I = P \times r \times t$

I is interest charged
P is principal or original amount
r is rate of interest
t is length of time

Example:

Susan borrows Le900 to fix her car. The bank charges 7% interest for two years. Find the interest she will pay the bank.

$I = P \times r \times t$	State the formula
$I = 900 \times \frac{7}{100} \times 2$	Substitute the values
$I = \frac{900 \times 7 \times 2}{100}$	Simplify
$I = Le126$	Solve

Simple interest is used for:

* **Discount:** Amount subtracted from original price, usually written as a percentage.
Discount = rate × original price
Sale price = original price – discount

* **Commission:** Amount earned for selling something, usually a percent of the sale.
Commission = selling price × rate of commission

* **Sales tax:** Government adds a percentage onto the price of some items, which is paid to them.
Sales tax = cost of item × tax rate

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 7: Finances

Exercise

1. Calculate the total amount I will have in the bank after 3 years if
   a. I invest Le 2000 at 5% per year simple interest.
   b. I invest Le 5000 at 10% per year simple interest.
2. Calculate the total amount of interest I will pay after 6 years if
   a. I borrow Le 30 000 at 4% per year simple interest.
   b. I borrow Le 60 000 at 12% per year simple interest.
3. I invested some money in the bank at 5% per year simple interest.
   After a year I had earned Le 1000 in interest. How much money did I invest?
4. I invested some money in the bank at 10% per year simple interest.
   After 3 years I had earned Le 1500 in interest. How much money did I invest?
5. I borrow Le 20 000 and I am charged 5% simple interest per month.
   If I don't pay the money back, after how many months will I owe double the amount I borrowed?
6. I buy a TV that costs Le 800 000 on hire purchase. The store charges me 15% interest per year.
   I pay back over 3 years.
   a. What is the total amount I need to pay back?
   b. What are my monthly installments?

7a. Find the sale price for an item that has a price tag of Le1000 and a discount rate of 20%.

b. A pair of jeans with a price of Le 9000 has a discount of 30%. What is the discount?
What is the sale price of the jeans?

8. Juliet is an estate agent and earns 5% commission on her total sales. She sells a house for Le 7,500,000.
   What will her commission be?
9. Yayah earns 4% commission on every vehicle he sells. What is his commission on a car sold for Le 10,000,000?
10. Abu buys clothes that cost Le 8000 altogether. If there is a 7% sales tax rate, what is the total cost of the items?
11. Foday buys a new bike that costs Le 300, 000 before sales tax. If the sales tax rate is 4%, what is the total cost of the bike?

Check your answers:

1a. Interest = $2000 \times \frac{5}{100} \times 3 =$ Le 300
Total = 2000 + 300 = Le 2 300

b. Interest = $5000 \times \frac{10}{100} \times 3 =$ Le 1500
Total = 5000 + 1500 = Le 6 500

2a. Interest = $30\,000 \times \frac{4}{100} \times 6 =$ Le 7 200
Total = 30 000 + 1500 = Le 37 200

b. Interest = $60\,000 \times \frac{12}{100} \times 6 =$ Le 43 200
Total = 60 000 + 43 200 = Le 103 200

3. $1000 = P \times \frac{5}{100} \times 1$
$P = 1000 \div \frac{5}{100} =$ Le 20 000

4. $1500 = P \times \frac{10}{100} \times 3$
$P = 1500 \div \frac{30}{100} =$ Le 5 000

5. Interest per month = $20\,000 \times \frac{5}{100} = 1000$
After 20 months (1 year and 8 months),
I owe 20 000 interest + 20 000 borrowed.

6. Interest = $900\,000 \times \frac{15}{100} \times 3 = 405\,000$

a. Total = 900 000 + 405 000 = Le 1,305,000

b. 3 years = 36 months
1,305,000 ÷ 36 = Le 36,250

7a. 20% × Le 1000 = Le 200

b. 30% × Le 9000 = Le 2 700
price of jeans = 9000 – 2700 = Le 6300

8. 5% × 7,500,000 = Le 375,000

9. 4% × 10,000,000 = Le 400,000

10. 7% × 8000 = Le 560

11. 4% × 300,000 = Le 12,000
Total cost of bike = Le 312,000

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 8: Measurement M-07-071 to M-07-074 p67 – 77

Check that you can:
* use basic measurement units for length (metres), mass (grams) and volume (litres)

VOCABULARY:
metric system; units of measurement of length (mm, cm, m, km), mass (mg, g, kg, tonnes), volume (ml, d, ℓ, kl); capacity; convert units

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 63 – 69.

CONCEPTS:

*** Metric System**

Length is measured in: millimetre (mm), centimetre (cm), metre (m), kilometre(km).

Mass is measured in: milligram (mg), gram (g), kilogram (kg), tonne (t).

Volume is measured in: millilitre (mℓ), decilitre (dℓ), litre (ℓ), kilolitre (kℓ).

* **Capacity** of a container is how much it can contain

* Use the appropriate unit of measurement

Examples:
- litres for bath water
- ml for medicine
- km for travel
- mm for the length of a card.

* **Conversions:**

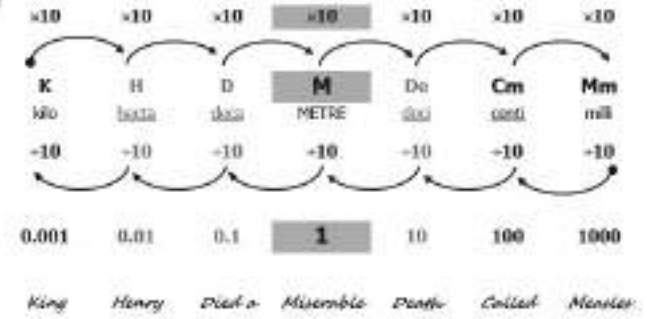
When converting from bigger units (km) to smaller units (m), we multiply

Example: 5km = 5000m

Converting from smaller units (g) to bigger units (kg), we divide.

Examples: 300g = 0,3kg

Converting length (see next page)



Converting mass

Use the same conversions as for length to show
1 gram = 1000 mg and 1 kg = 1000 g.

Converting capacity

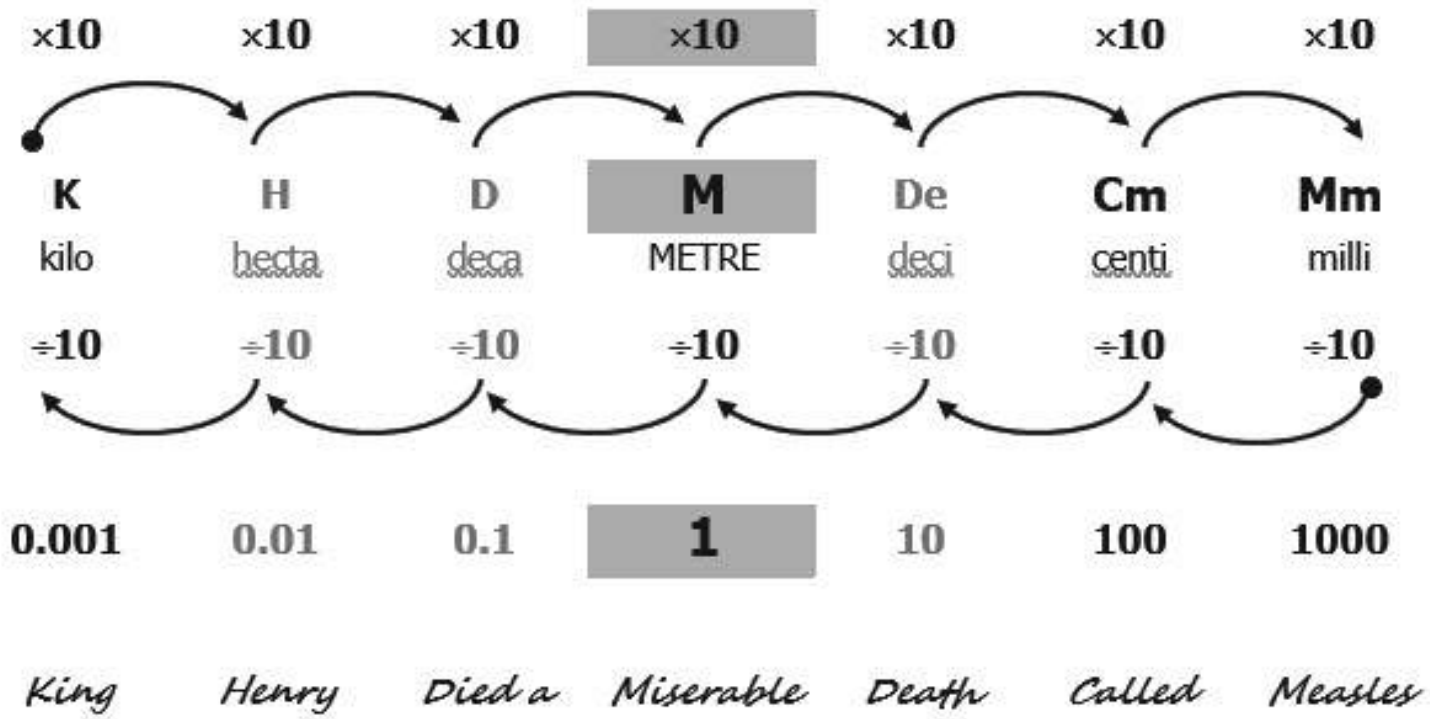
Use the same conversions to show that
1 ℓ = 1000 mℓ and 1 kℓ = 1000 ℓ.

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2



JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 8: Measurement

Exercise

1. What units of measurement do we use for each of the following?
   a. volume of water in a bath b. mass of a child c. mass of carrots d. length of a soccer field
   e. length of a matchbox f. tablets for pain g. capacity of a dam h. weight of a truck
   i. petrol in a car j. length of an ant k. distance between two towns

2. Convert the following:
   a. 2100 metres to kilometres. b. 85 km to metres. c. 135 cm to metres.
   d. 9067 mm to metres rounded off to one decimal place

3. Add 307 cm, 639 cm and 216 cm. Then, express your answer in metres to one decimal place.

4a. Convert 8329 mg to grams
   b. Express 5.26 kg in grams
   c. How many kilograms are there in 1.088 tonnes of copper?
   d. Change 9875 mg to grams. Round your answer to 2 decimal places.

5a. Convert 750 millilitres to litres.
   b. Convert 2089 litres to kilolitres.
   c. Change 435 decilitres to litres.

6a. When we convert from millimetres to centimetres, should we multiply or divide?
   b. What number do we multiply by to convert kilometres to metres?
   c. When we convert from decilitres to litres, should we multiply or divide?
   d. What number do we divide by to convert litres to kilolitres?
   e. When we convert from kilograms to grams, should we multiply or divide?
   f. What number do we multiply by to convert grams to milligrams?

Check your answers:

1a. litres (l) b. kilograms (kg)
c. grams (g) d. metres (m)
e. centimetres (cm) or millimetres (mm)
f. milligrams (mg) g. kilolitres (kl)
h. tons (t) i. litres (l)
j. millimetres (mm) k. kilometres (km)

2a. 21 km b. 85,000
c. 1.35 m d. 9.1 m
3. 11.6 m
4a. 8.329 g b. 5260 g
c. 1088 kg d. 9.88 g

5a. 0.75 *l* b. 2.089 kl
c. 43.5 *l*
6a. divide
b. 1000
c. divide
d. 1000
e. multiply
f. 1000

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 9: Revision of plane shapes M-07-075 p78 – 80

Check that you know:
* the properties of rectangles, squares and triangles

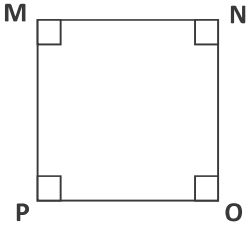
VOCABULARY:
Angle, side, shape, rectangle, square, triangle; quadrilateral; equilateral /isosceles /scalene triangle; right-angled triangle

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 70 – 76.

CONCEPTS:

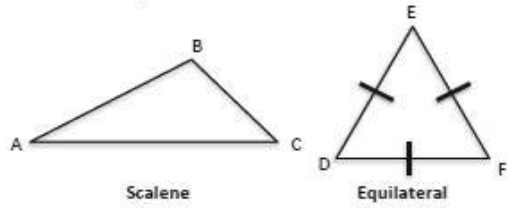
* Revise the properties of the sides and angles of rectangles, squares and triangles
* shapes can be named using the letters at their corners e.g. square MNOP
* right angles are marked with a square; other angles with a curved line
* equal sides are marked with small lines

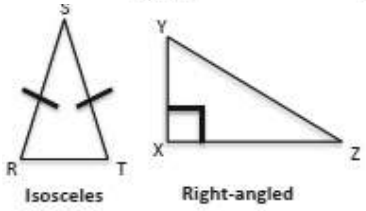
Example:



* squares and rectangles are called **quadrilaterals** (four sides)

* An **equilateral** triangle has 3 equal sides
* An **isosceles** triangles has 2 equal sides
* A **scalene** triangle has 3 different lengths of sides
* A **right-angled** triangle has one 90 degree angle





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JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

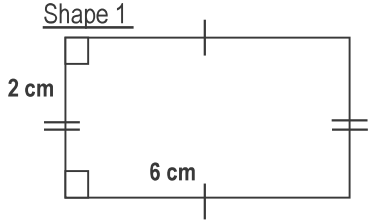
Topic 9: Revision of plane shapes

Exercise

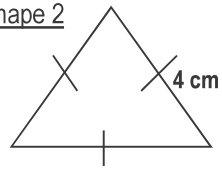
For each shape below,

1. Name the type of shape.
2. List the properties of the shape.
3. Find the perimeter of the shape.

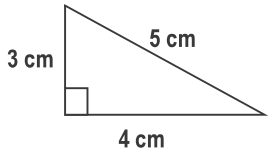
Shape 1



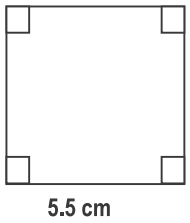
Shape 2



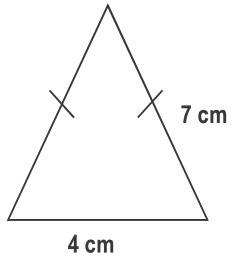
Shape 3



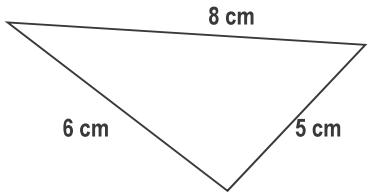
Shape 4



Shape 5



Shape 6



Check your answers:

Shape 1: rectangle
-opposite sides equal
-right angles
-opposite sides parallel
Perimeter: 16 cm

Shape 2: equilateral triangle
-all sides equal
-all angles equal
Perimeter: 12 cm

Shape 3: right angled triangle
-one right angle
Perimeter: 12 cm

Shape 4: square
-all sides equal
-right angles
-opposite sides parallel
Perimeter: 22 cm

Shape 5: isosceles triangle
-two sides equal
-angles opposite equal sides are equal
Perimeter: 18 cm

Shape 6: scalene triangle
-all sides different lengths
Perimeter: 19 cm

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 10: Area & perimeter M-07-077 to M-07-080 p84 – 97

Check that you know:
* the properties of rectangles, squares and triangles

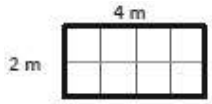
VOCABULARY:
Perimeter; area; squared units; base & perpendicular height of a triangle; length & breadth of a rectangle

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 77 – 84.

CONCEPTS:

* The **perimeter** of a shape is the total distance around the edges of the shape

Example: P of rectangle = 2 + 4 + 2 + 4 = 12 m



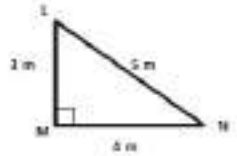
* The **area** of a shape is the size of the space inside the shape.
We can find area by counting the number of square units inside the shape
* For the area of a rectangle or a square, we can also multiply length × breadth.

Example: Area of rectangle = 8 square units
Area = length × width = 4m × 2m = 8m^2

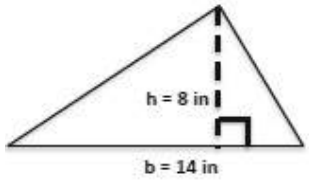
*** Area of a triangle**

A = ½ base × height = ½ bh

Example: Area LMN = ½ × 4 × 3 = 6 m^2



Remember to use the **perpendicular** height



Area = ½ × 8 × 14 = 56 in^2

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

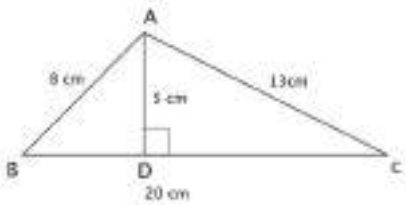
for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 10: Area & perimeter

Exercise

1. If $\widehat{B} = 90°$, AB = 27 mm and BC = 14 mm, determine the area of ΔABC in mm^2 .

2. 

In ΔABC, BC = 20 cm; AC = 13 cm; AB = 8 cm and AD = 5cm.

a. Calculate the perimeter of ΔABC

b. Calculate the area of ΔABC

c. If CD = 12 cm, calculate the perimeter of ΔABD

d. Calculate the area of ΔABD

3. Convert:

a. 900 mm to _____ cm

b. 7 km to _____metres

c. 7,6 m to _____ cm

d. 1 km 320 m to _____ m

e. 943 217 m to _____ km

4. What is the area of a rectangle that has a length of 45 m and a breadth of 10 m?

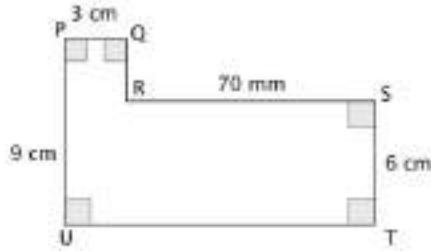
5. Calculate the perimeter of a rectangle that has a breadth of 15 cm and a length of 19 cm.

6. If the area of a rectangle is 1323 cm^2 and the length is 63 cm, calculate the breadth.

7. If the area of a triangle is 175 m^2 and the base is 5 m, calculate the length of the perpendicular height.

8. a. Determine the perimeter of the shape PQRSTU

b. Determine the area of the shape PQRSTU



Check your answers:

1. Area = ½ b × h
   = ½ × 27 × 14 = 378 mm^2

2a. Perimeter ΔABC = 8 + 13 + 20 = 41 cm.

b. Area ΔABC = ½ b × h
   = ½ × 20 × 5 = 50 cm^2

c. BD = BC – CD = 20 – 12 = 8 cm
   Perimeter ΔABD
   = 8 + 13 + 8 = 29 cm.

d. Area ΔABD = ½ b × h
   = ½ × 8 × 5 = 20 cm^2

3a. 90 cm b. 7,000 m
c. 760 cm d. 1,320 m
e. 943.217 km

4. Area rectangle = 45 × 10 = 450 m^2

5. Perimeter = 68 cm

6. Breadth = 1323 ÷ 63 = 21 cm

7. Area Δ = 175 m^2 = ½ × 5 m × h
   h = 175 ÷ (½ × 5) = 70 m

8a. Perimeter PQRSTU
= 3 cm + 7 cm + 6 cm + 10 cm + 9 cm
= 35 cm

b. Area PQRSTU = 10 × 6 + 3 × 3
   = 69 cm^2

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 11: Circles M-07-081 to M-07-085 p98 – 113

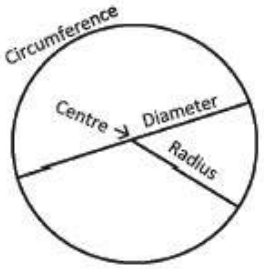
Check that you can:
* round off decimal numbers

VOCABULARY:
centre of circle, circumference, radius (plural is radii), diameter; pi (π); approximate value of pi

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 85 – 91.

CONCEPTS:

* The radius is half of the diameter
* The diameter is twice the radius



* Circumference of a circle **C = 2 πr**
* Area of a circle = $\boldsymbol{\pi r^2}$

where $\pi \approx \frac{22}{7} \approx 3.140020$

Example:
Calculate the perimeter of a circle that has a diameter of 140mm.

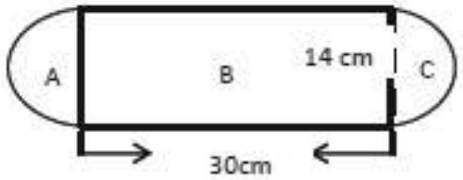
$C = 2\pi r = 2 \times \frac{22}{7} \times 14 = 88$ cm.

Example:
A semi-circle has a diameter of 28cm.

$C = \frac{1}{2}(2\pi r) + d = \pi r + d$

$= \frac{22}{7} \times 14 + 28 = 72$ cm.

Example:
Find the perimeter and the area of this shape using the rectangle and the semi-circles.



Perimeter = circumference of A and C + 30 cm + 30 cm

$= 2\pi r + 60$ cm (radius is 7 cm)

$= 2 \times \frac{22}{7} \times 7 + 60 = 40 + 60 = 100$ cm.

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 11: Circles

Exercise

Note: Use $\pi = \frac{22}{7}$ *and round off to 2 decimal places*

1. Calculate the circumference of a circle that has a diameter of 42 cm.
2. Calculate the area of a circle that has a diameter of 42 cm.

3. Calculate a) the area and b) the circumference of a circle that has a radius of 7 cm.

4. Calculate a) the area and b) the circumference of a circle that has a diameter of 18 m. Round off answers to two decimal places if necessary.

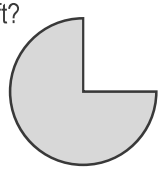
5. If the area of a circle is 50.27 cm^2, calculate (correct to 2 decimal places)
   a. the length of the radius b. the diameter c. the circumference

6. The diameter of the circle is 16 m.

   a. A quarter of the circle is removed. What fraction of the circle is left?

   b. Calculate the area of this shape.

   c. Calculate the perimeter of this shape.



Check your answers:

1. C = 2πr = $2 \times \frac{22}{7} \times 21 = 132$ cm

2. Area of circle = $\pi r^2 = \frac{22}{7} \times 21^2 = 1386$ cm^2

3a. Area of circle = $\pi r^2 = \frac{22}{7} \times 7^2 = 154$ cm^2

b. C = 2πr = $2 \times \frac{22}{7} \times 7 = 44$ cm

4a. Area of circle = $\pi r^2 = \frac{22}{7} \times 9^2 = 254.57$ cm^2

b. C = 2πr = $2 \times \frac{22}{7} \times 9 = 56.57$ cm

5. Area of circle = 50.27 cm^2 = $\pi r^2 = \frac{22}{7} \times 7^2 = 154$ cm^2

$r^2 = \frac{50.27}{\pi} = 50.27 \times \frac{7}{22} = 15.995 \approx 16$ cm

a. $r = 4$ cm

b. diameter = 8 cm

c. C = 2πr = $2 \times \frac{22}{7} \times 4 = 25.14$

6a. three quarters.

b. Area of shape = $\frac{3}{4} \times \pi r^2$

$= \frac{3}{4} \times \frac{22}{7} \times 8^2 = 150.86$ cm^2

c. C of ¾ of circle = ¾ (2πr) = $\frac{3}{4} \times 2 \times \frac{22}{7} \times 8 = 37.7$

P of shape is 37.7 + 2 × radius = 37.7 + 16 = 53.7 m

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 12: Volume of solids M-07-086 to M-07-090 p114 – 127

Check that you know:

- How to find area of a square and a rectangle
- That solids have three dimensions

VOCABULARY:

prism; cross-section; units cubed (cubic units); cube; cuboid; rectangular prism; face (of a prism); base (of a prism)

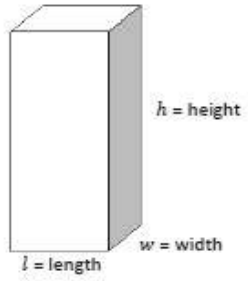
Refer to JSS1 Pupil's Handbook (PHB) pages 92 – 97 and the Lesson Plan Manual.

CONCEPTS:

* The volume of a solid is a measure of the amount of space it takes up.

Volume = Area of one base face × height

= length × width × height



* **Rectangular prism** and **cuboid** are names for the same solid
* Volume of a **cube** = $l \times l \times l = l^3$

* If you know the volume and the area of one face of the solid, you can find the other dimension.

Example:

A box has a base with area 81cm^2 and a volume of 810cm^3. Find the missing length.

V = Area × l

810 = 81 × l

l = 810 ÷ 81 = 10cm

Example: A water tank is 2m long and 3m wide. The depth of the water inside is 50 cm. What is the volume of the water inside?

Remember to convert cm to m. 50 cm = ½ m

V = 2 × 3 × ½ = 3m^3

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

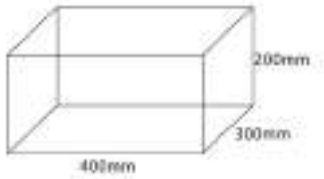
Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 12: Volume of solids

Exercise

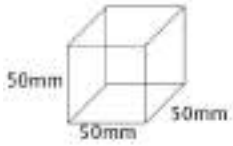
1. A carton that is the shape of a rectangular prism is 30 cm long, 20 cm wide and 10 cm high. Calculate the volume of the carton

2. a. Find the volume of the rectangular prism shown here. Give your answer in mm^3

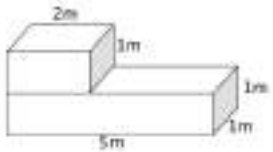


   b. Convert your answer to a volume in cm^3

3. Find the volume of the cube in cm^3



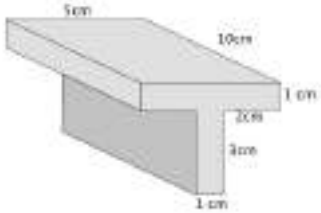
4. I have two boxes that are both rectangular prisms. I stick them together as shown alongside. Calculate the total volume of the boxes.



5. A swimming pool is shaped as a rectangular prism. It is 3 m long, 2 m wide and 1 m deep. Find the volume of water (in m^3) in the swimming pool if it is filled to the top.

6. a. A cube has a volume of 25.625 cm^3. What is the length of the side of the cube?
   b. A cube has side length of 5 cm. What is the volume of the cube?

7. The solid shown here is made up of two rectangular prisms that have been joined. What is the volume of the solid?



Check your answers:

1. Volume = $l \times b \times h$
$= 30\ \text{cm} \times 20\ \text{cm} \times 10\ \text{cm}$
$= 6\,000\ \text{cm}^3$

2a. Volume = $300 \times 400 \times 200$
$= 24{,}000{,}000\ mm^3$

b. $24{,}000\ cm^3$

3. Volume = $5\ cm \times 5\ cm \times 5\ cm$
$= 125\ cm^3$

4. Volume
$= (2\ m \times 1\ m \times 1\ m) + (5\ m \times 1\ m \times 1\ m)$
$= 7\ m^3$

5. $3\ m \times 2\ m \times 1\ m = 6\ m^3$

6a. $\sqrt[3]{25.625}$
$= 2.948$ (to 2 decimal places)
Length of side ≈ 2.95 cm.

b. Volume $= 5^3 = 125\ cm^3$

7. Volume $= (5 \times 10 \times 1) + (3 \times 1 \times 10)$
$= 50 + 30 = 80\ cm^3$

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 13: Construct, measure & calculate angles M-07-091 to M-07-095 p127 – 145

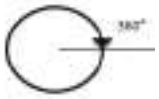
Check that you can identify:
* angles and lines in a shape

VOCABULARY:
Angle; acute/obtuse/right angle; degrees; vertex & arms of an angle; protractor; sum of angles in a triangle; equilateral, isosceles, scalene triangle; composite shape

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 98 – 105.

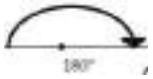
CONCEPTS:

* We measure angles in degrees (°)
There are 360° around a point.



The **arms** of an angle meet at the **vertex**.

A half turn is 180° (on a straight line)

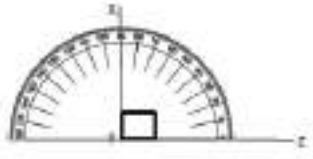


A quarter turn is 90° (right angle)

An **acute** angle is less than 90°

An **obtuse** angle is between 90° and 180°

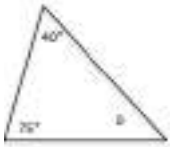
A **protractor** is used to measure angles in degrees.



We can also estimate the size of angles by comparing them to angles that we know.

* The sum of the angles of a triangle is 180°.

Example:



40° + 75° + b = 180° so b = 65°

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 13: Construct, measure & calculate angles

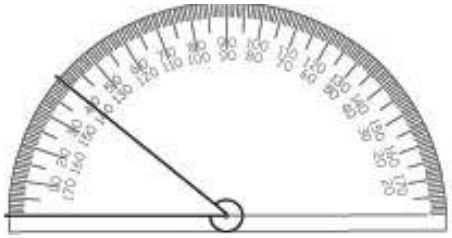
Exercise

1. How many degrees are there in a revolution?
2. What do we call angles that share a common vertex and a common arm?
3. What do we call the point where the two arms of an angle meet?
4. Give the name of the *type* of angle for each of the angles below:

   a. 40° b. 180° c. 275° d. 120°

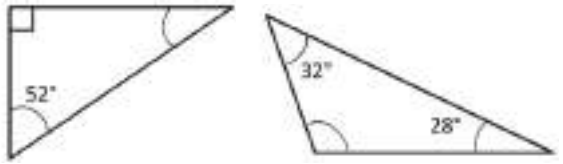
e) f) g) h)

5. An angle that is between 90° and 180° is called an _____ angle.
6. A reflex angle lies between ____° and ____°
7. ° is the symbol for _____
8. The protractor below measures ∠ XYZ to be _____°



9. Calculate the missing angle in each triangle.

a. b.



Check your answers:

1. 360°
2. adjacent angles
3. vertex

4a. acute angle b. straight angle
c. reflex angle d. obtuse angle
e. obtuse f. acute
g. reflex h. right angle

5. obtuse
6. 180° and 360°
7. degrees
8. 40°

9a. 52° + 90° + missing angle = 180°.
52° + 90° = 142°. Missing angle = 38°

b. 32° + 28° + missing angle = 180°.
Missing angle = 120°

c. c. 124° + 2 equal missing angles = 180°.
56° = 2 × missing angle.
Missing angle = 28°

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 14: Angles M-07-096 to M-07-098 p146 – 154

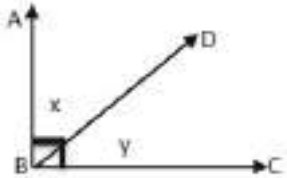
Check that you can identify:
* angles and right angles

VOCABULARY:
complementary angles;
supplementary angles

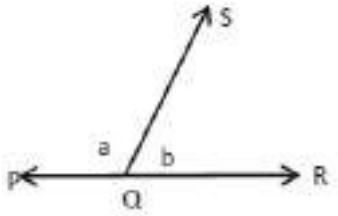
Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 98 – 105.

CONCEPTS:

* Angles that add up to 90 degrees are called **complementary** angles.
* Angles x and y are complementary. Angles ABD and DBC are complementary

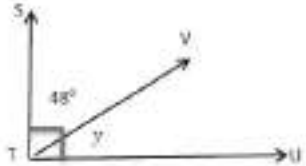


* Angles that add up to 180 degrees are called **supplementary** angles.
* Angles a and b are supplementary. Angles PQS and RQS are supplementary.



Complementary angles form a corner (90 degrees).
Supplementary angles form a straight line (180 degrees).

Examples:



Angle STU is a right angle, so it is 90 degrees.
Angles STU and VTU are complementary.
y + 48° = 90° y = 42°

Angles x and 42° are supplementary.
x + 42° = 180° x = 132°

Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

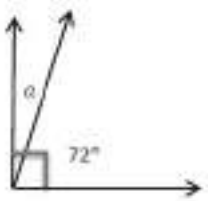
Topic 14: Angles

Exercise

1. Use the diagram below to answer the questions.

   a. How do we know that a + 72° is complementary?

   b. Find the value of angle a.



2a. If x and 36° are complementary angles, find the value of angle x.

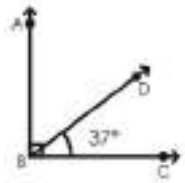
b. If y and 15° are complementary angles, find the value of angle y.

c. If x and 85° are supplementary angles, find the value of angle x.

d. If y and 65° are supplementary angles, find the value of angle y.

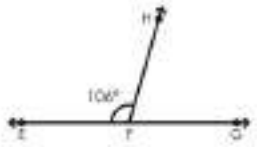
3. Calculate the size of the missing angles.

a.

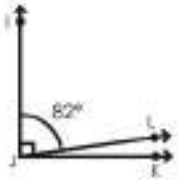


b.

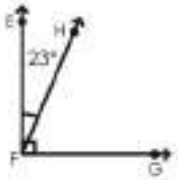
c.



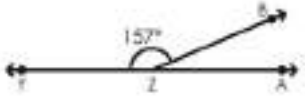
d.



e.



f.



Check your answers:

1a. The angles a and 72° share a common arm in a given right angle, so they are complementary.

b. a + 72° = 90°

a = 18°

2a. x + 36° = 90° x = 54°

b. y + 15° = 90° y = 75°

c. x + 85° = 180° x = 95°

d. x + 65° = 180° x = 115°

3a. ∠ ABD = 53° (complementary)

b. ∠ ABD = 163° (supplementary)

c. ∠ GFH = 74° (supplementary)

d. ∠ LJK = 8° (complementary)

e. ∠ HFG = 57° (complementary)

f. ∠ AZB = 23° (supplementary)

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

Topic 15: Intersecting lines and parallel lines M-07-099 to M-07-100 p155 – 160

Check that you can identify:
* vertical, horizontal, parallel and perpendicular lines

VOCABULARY:
Vertical, horizontal, parallel lines, perpendicular lines, vertically opposite angles

Refer to JSS1 Lesson Plan Manual and Pupil's Handbook (PHB) pages 98 – 105.

CONCEPTS:

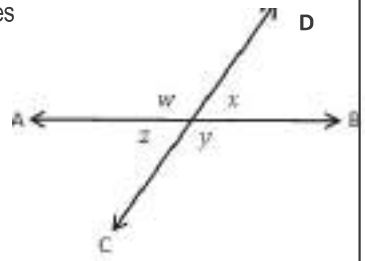
* Intersecting lines AB and CD make angles *w*, *x*, *y* and *z*.
* These angles made on two intersecting lines are supplementary.

$w + x = 180°$ $\quad z + y = 180°$

$x + y = 180°$ $\quad w + z = 180°$

* The angles opposite each other on two intersecting lines are equal.

$\hat{w} = \hat{y}$ and $\hat{z} = \hat{x}$



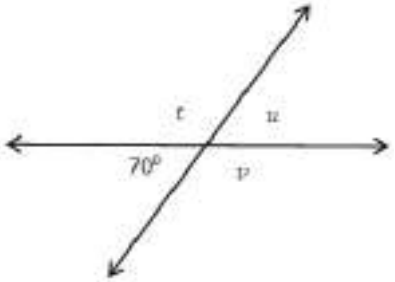
Example:

$\hat{t} + 70° = 180°$

$\hat{t} = 110°$

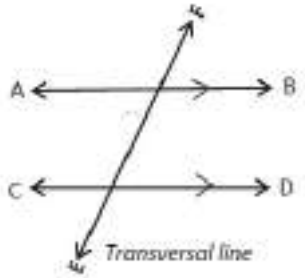
$\hat{u} = 70°$

$\hat{v} = 110°$



* Parallel lines are two lines on a plane that never meet. They are always the same distance apart.

* AB and CD are parallel lines. The transversal EF intersects AB and CD.
* We write AB // CD



Example:

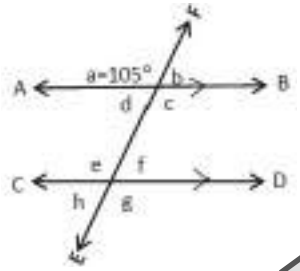
a = 105° is given.

b = 75° supplementary

b = f (corresponding angles AB // CD)

d = f (alternate angles AB // CD)

c + f = 180 (cointerior angles AB // CD)



Ready to work with pupils.

JSS1 Mathematics Topic Progress Chart

for Maths Captains (to support JSS2 pupils)

Based on Lesson plans for JSS Mathematics JSS1, Term 2

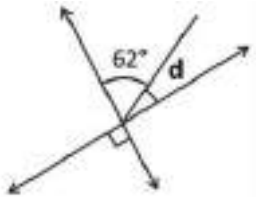
Topic 15: Intersecting lines and parallel lines M-07-099 to M-07-100 p155 – 160

Exercise

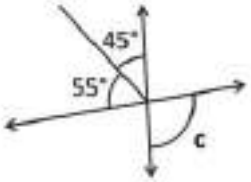
1. A straight angle is an angle of _____°.
2. Angles that are vertically opposite on 2 intersecting lines are _____
3. Parallel lines are lines that _____ meet.
4. || represents _____lines.

5. Calculate the size of the angles:

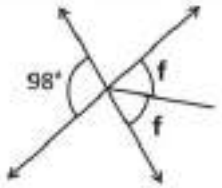
a.



b.

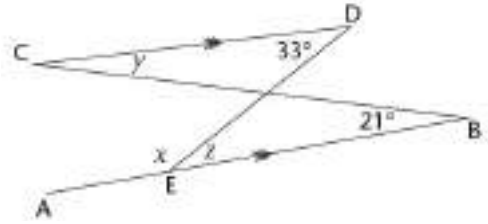


c.

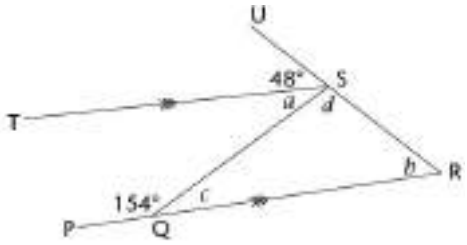


6. Calculate the size of the angles:

a.



b.



Check your answers:

1. 180°
2. equal
3. never
4. parallel

5a. d + 62° = 90°
d = 28°
b. c = 45° + 55° = 100°
c. 98° = 2f
f = 49°

6a. ∠ D = 33 (given)
y = 21° (alternate angles AB // CD)
z = 33° (alternate angles AB // CD)
x = 147° (cointerior angles AB // CD) or
(x and z suppl. ∠s on str line)

b. 154° + a = 180° (cointerior angles PR // TS) or
a = 26°
154° + c = 180° (suppl. ∠s on straight line)
c = 26°
b = 48° (corresponding angles PR // TS)
d + b + c = 180° (angles of triangle QSR)
d = 106°