

S2 Revision

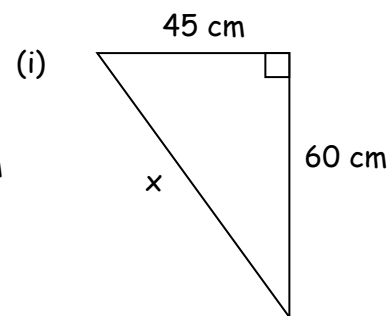
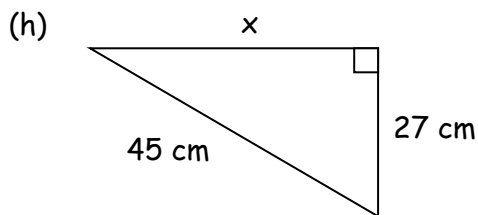
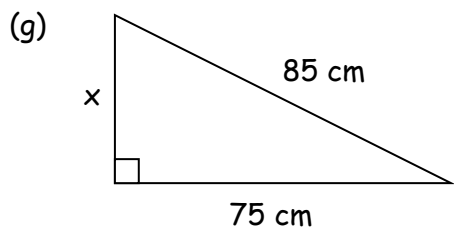
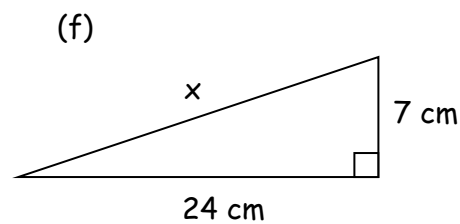
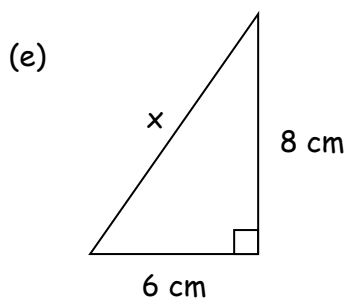
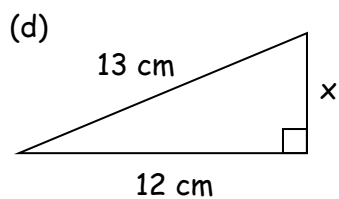
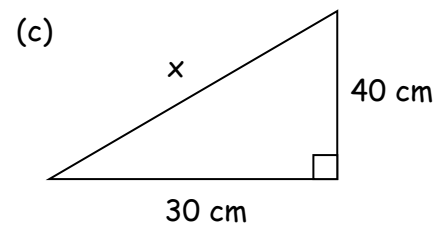
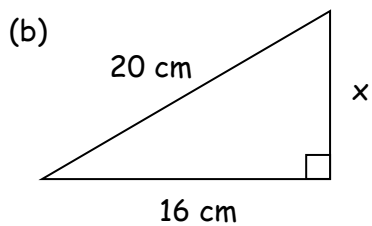
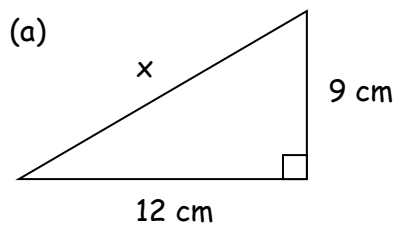
April Assessment



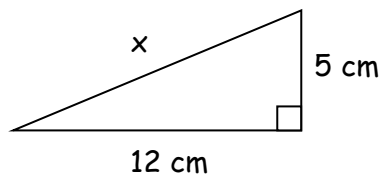
**Calculators may be used.
Show all working.**

Pythagoras

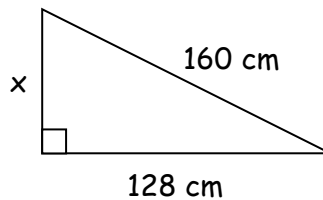
Calculate the length of the side x in each right-angled triangle.



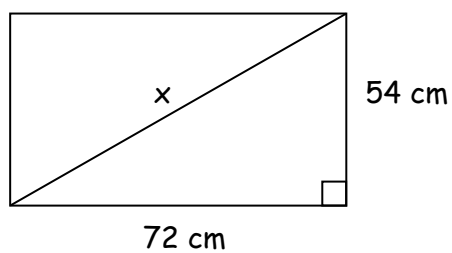
2. Calculate the length of this ramp.



3. Calculate the height of this triangular support.



4. A black line runs diagonally from corner to corner on this rectangular flag. Calculate the length of the black line.



SCIENTIFIC NOTATION

1. Write the following numbers in scientific notation.

- a) 70,000
- b) 300,000
- c) 800,000,000
- d) 9,000,000,000
- f) 0.00003
- g) 0.000009
- h) 0.0000002

2. Express the following in scientific notation.

- a) 992500000
- b) 0.0000708360
- c) 0.00527
- d) 27017
- e) 0.26377
- f) 92180000
- g) 494000
- h) 1740000000
- i) 0.000000001580
- j) 20 23340

3. In 1980, major airlines flew 5,400,000 flights. Write the number of flights in scientific notation.

4. A pollen grain measures 0.0004 m in diameter. Write this measurement in scientific notation.

5. To measure long distances in space, astronomers use a unit called a light-year. A lightyear is approximately 5,880,000,000,000 miles long. Write this in scientific notation.

6. Leah takes 2.3×10^4 steps during a long-distance run. Each step covers an average of 780 mm. What total distance did Leah cover during her run? Write your answer in scientific notation.

7. A small bat can eat up to 1,000 mosquitos in an hour. How many mosquitos can a small bat eat in 20.4 hours? Express your answer in scientific notation.

MIXED QUESTIONS ON RATIO

1. In a cat and dog home, the ratio of cats to dogs is 25 : 40.
Write this ratio in its simplest form.
2. The ratio of men to women at a party is 3 : 2.
If there are 18 men at the party, how many women are there?
3. Alex and James share £160 in the ratio 5 : 3.
How much will each person receive?
4. The ratio of Derek's wages to Sharon's wages is 150 : 250.
Write this ratio in its simplest form.
5. On a train the ratio of men to women is 3 : 4.
If there are 60 men on the train, how many women are there?
6. Carol and Dennis share £80 in the ratio 3 : 1.
How much will each person receive.
7. The ratio of tennis players to golfers at a club is 100 : 350.
Write this ratio in its simplest form.
8. On a school trip the ratio of teachers to pupils is 3 : 10.
If there are 12 teachers on the trip, how many pupils are there?
9. Alison and Colin share a prize of £500 in the ratio 7 : 3.
How much will each person receive?
10. To make a shade of purple paint, blue paint and red paint are mixed in the ratio 600 : 1000. Write this ratio in its simplest form.
11. The ratio of three people's wages is 450 : 300 : 250. Write this ratio in its simplest form.
12. The ratio of vowels to consonants in a book is 4 : 9. If there are 12 000 vowels in the book, how many consonants are there?
13. Ed, Ted and Zed £200 in the ratio 2 : 3 : 5.
How much will each person receive?
14. A 3000 kilometre "crazy rally" is being held for charity. Each participant will walk, cycle and drive in the ratio 1 : 2 : 3.

How far will each participant: (a) walk
(b) cycle
(c) drive?

PROPORTION

1. 3 hats cost £120. How much will 5 hats cost?
2. 6 clocks cost £210. How much will 2 clocks cost?
3. 8 lamps cost £200. How much will 6 lamps cost?
4. 5 chairs cost £300. How much will 3 chairs cost?
5. 4 gold rings cost £120. How much will 6 gold rings cost?
6. 5 cans of cola cost £2.25. How much will 8 cans of cola cost?
7. 7 cups of coffee cost £5.25. How much will 3 cups of coffee cost?
8. 3 plates of chips cost £1.65. How much will 5 plates of chips cost?
9. 3 metres of carpet tape costs £1.62. How much will 5 metres of carpet tape cost?
10. 3 metres of copper tubing costs £6.21. How much will 5 metres of copper tubing cost?
11. 40 nails weigh 800 grams. How much will 15 nails weigh?
12. 2 litres of paint covers 40 square metres of wall. How many square metres will 6 litres of this paint cover?
13. David types 90 words in 2 minutes. How many words will he type in 6 minutes?
14. It costs £20 for 4 people to get into the theatre. How much will it cost for 6 people to get into the theatre?
15. A lorry travels 120 kilometres in 2 hours. How far will the lorry travel in 4 hours?
16. A car travels 72 miles on 2 gallons of petrol. How far will the lorry travel on 5 gallons of petrol?
17. John's heart beats 168 times in 2 minutes, How many times will his heart beat in 5 minutes?
18. Andrew earns £18 for working 6 hours. How much will he earn for working 16 hours?
19. A dripping tap loses 48 litres of water in 4 days. How many litres of water will the tap lose in one week?
20. Ruth works in a soft-toy factory. She makes 60 elephants in 5 hours? How many elephants will she make in a 35-hour week?

MONEY

1. Mary is paid £165 per **week**.
Susan is paid £707 per **month**.
 - (a) Calculate Mary's **annual** pay.
 - (b) Calculate Susan's **annual** pay.
 - (b) Who earns more in a year and by how much?

2. John Smith earns a basic rate of £8 per hour.
One week he works 30 hours at the basic rate, 5 hours overtime at **time and a half** and 4 hours overtime at **double time**.
Calculate his **total** pay for this week.

3. A salesman earns a basic monthly salary of £800 **plus** 7.5% commission on all sales.
His total sales amounted to £16 000 one month.
 - (a) Calculate the commission earned.
 - (b) Calculate his **total** salary for this month.

4. A washing machine can be bought on hire purchase by paying a £50 deposit followed by 12 monthly instalments of £25.
Calculate the total hire purchase price.

5. The cash price of a computer is £1500.
The computer can be bought on hire purchase by paying a 20% deposit followed by 6 monthly instalments of £225.
 - (a) Calculate the deposit.
 - (b) Find the total hire purchase price.

6. A record shop bought 50 copies of a new music CD for a total of £375.
The shop then sold all 50 copies of the CD for £9.95 each.
How much **profit** did the shop make altogether after selling all 50 CDs?

STRAIGHT LINE

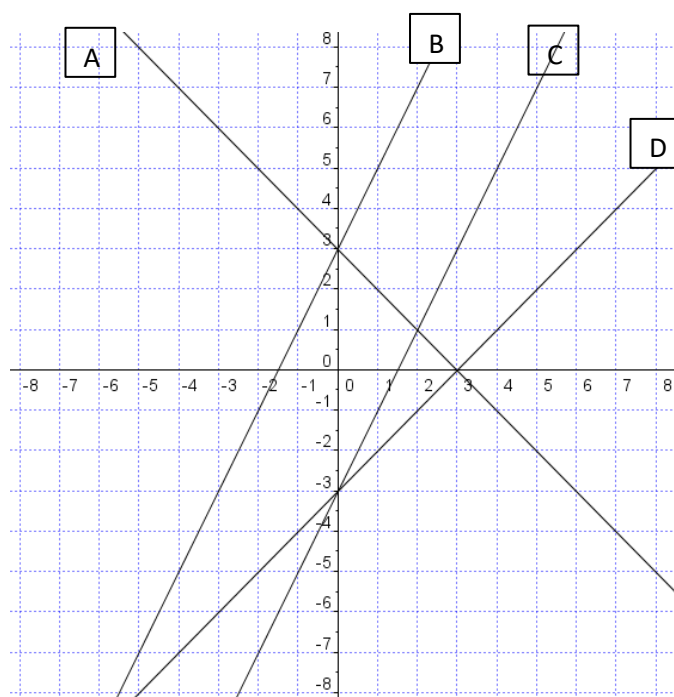
1. Write down the gradient and the y-intercept for the following straight line equations:

- a. $y = 3x + 2$
- b. $y = 4x - 7$
- c. $y = 5x + 12$
- d. $y = 4x - 9$
- e. $y = 5x$
- f. $y = x + 2$
- g. $y = -x + 3$
- h. $y = -3x + 7$

2. Using the gradient and the y-intercept, write down the equations of these lines:

- a. gradient: 4 intercept: (0,3)
- b. gradient: 2 intercept: (0,-4)
- c. gradient: 5 intercept: (0,-3)
- d. gradient: 1 intercept: (0,11)
- e. gradient: -3 intercept: (0,4)
- f. gradient: -4 intercept: (0,0)

3. Use the graph below to match the equations with the correct lines:



$y = 2x + 3$ matches with line

$y = 2x - 3$ matches with line

$y = x - 3$ matches with line

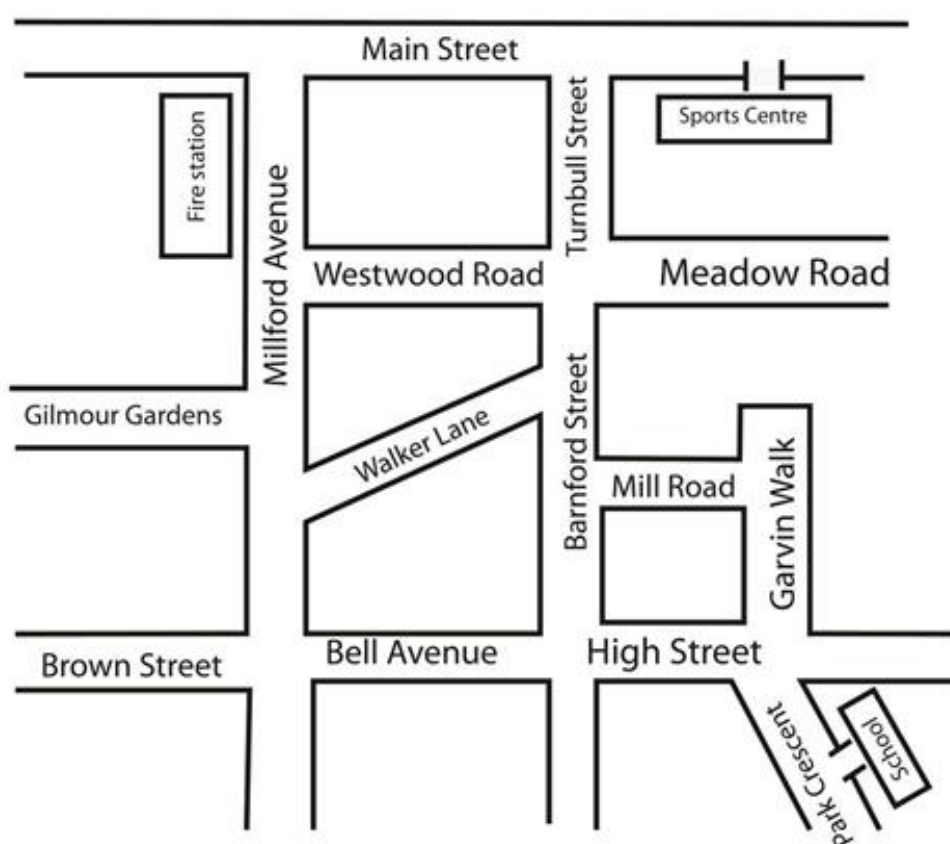
$y = -x + 3$ matches with line

SCALE DRAWING

You have been given the following directions by Sam to help you find his house in Bell Avenue.

- Come out of the Sports Centre on to Main Street and turn left.
- Go along Main Street then turn left into Turnbull Street.
- Go down Turnbull Street and Barnford Street and turn right into Bell Avenue.
- Sam's house is halfway along Bell Avenue.

(a) On the map below, show Sam's route and mark his house with X.

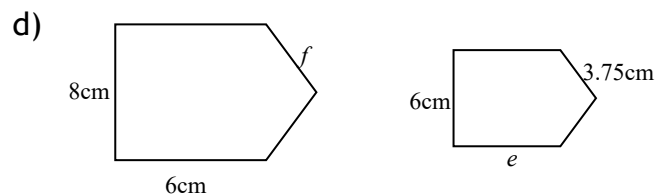
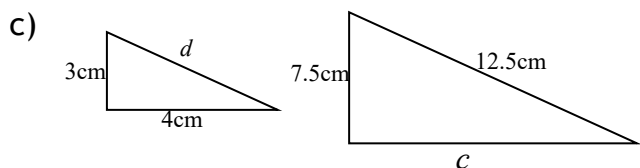
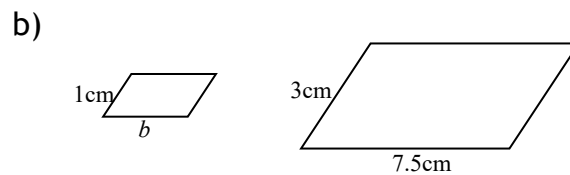
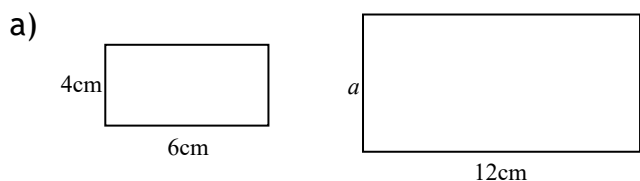


(b) The scale of the map is 1 cm = 100 m.
Estimate the distance you have to walk altogether to get from the Sports Centre to Sam's house.

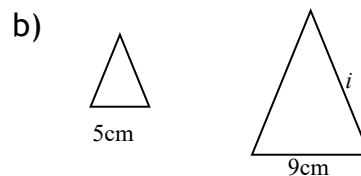
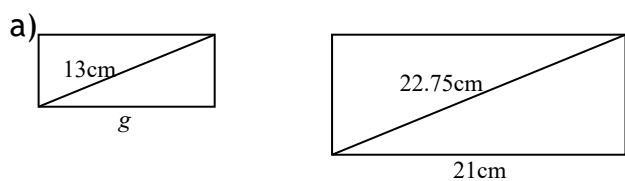
(a) Give directions to get from the Fire Station to the School.

SIMILAR SHAPES

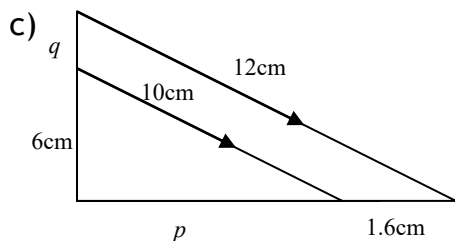
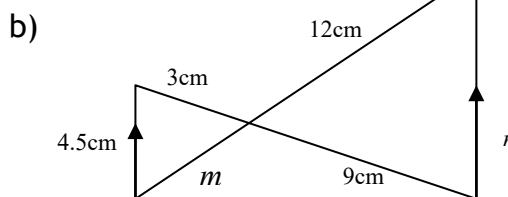
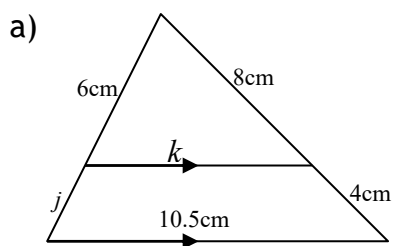
1. For each pair of similar shapes find the missing lengths.



2. Find the missing lengths in these similar shapes

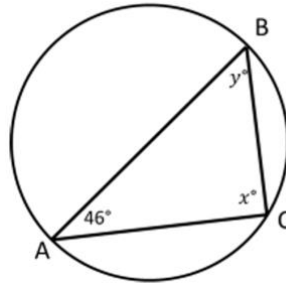


2. By drawing both triangles separately, work out the missing lengths in these diagrams.



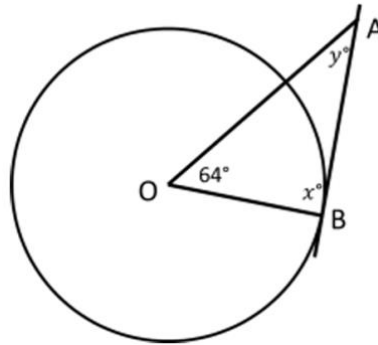
ANGLES IN CIRCLES

1. In the diagram, A , B , C are points on the circumference of a circle and the line AB is the diameter.



Find the size of angles x and y .

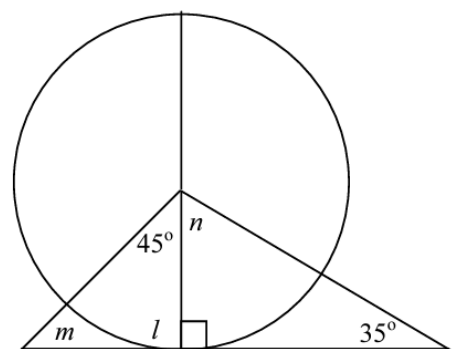
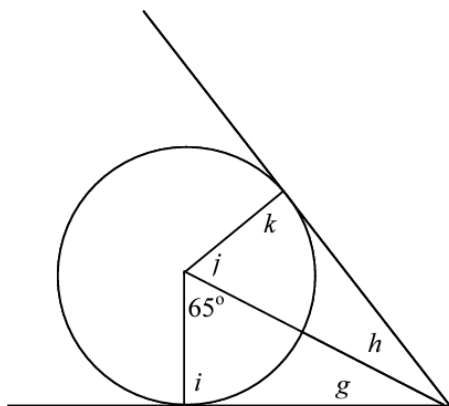
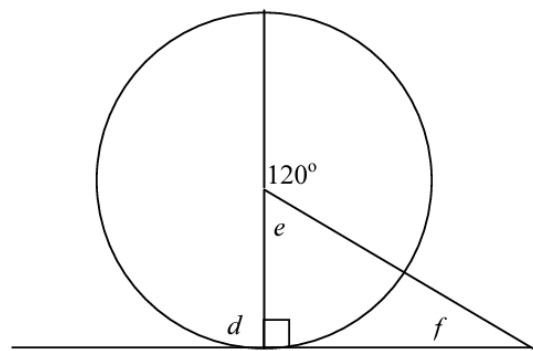
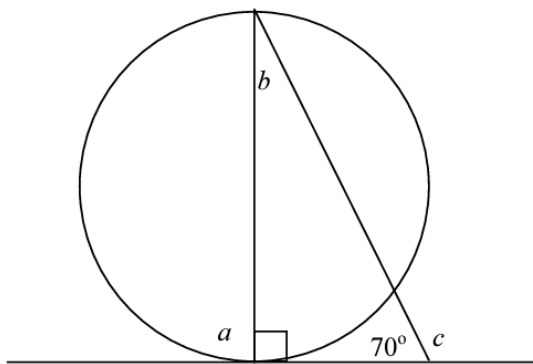
2. B is a point on the circumference of the circle, O is the centre of the circle and the line AB is a tangent to the circle.



Find the size of angles x and y .

3. In each of the diagrams below AB is a diameter. Find the missing angles in each diagram.
-

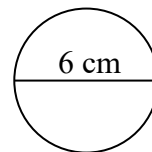
4. Calculate the sizes of the angles marked a, b, to n, in the diagrams below.



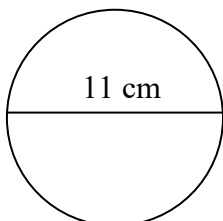
CIRCUMFERENCE OF CIRCLE

$$C = \pi d$$

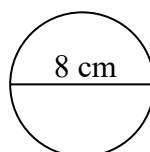
1. Calculate the circumference of a circle with **diameter** 6 cm.



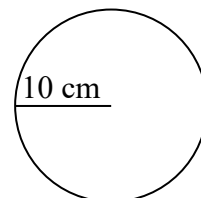
2. Calculate the circumference of a circle with **diameter** 11 cm.



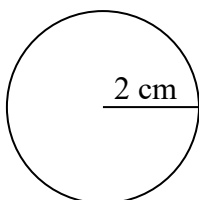
3. Calculate the circumference of this circle.



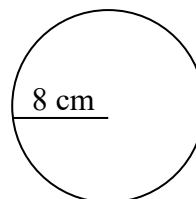
4. Calculate the circumference of a circle with **radius** 10 cm (careful).



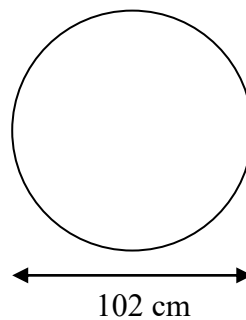
5. Calculate the circumference of a circle with **radius** 2 cm.



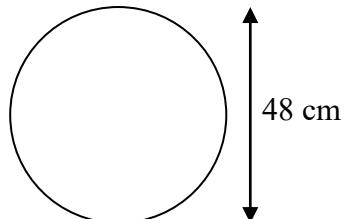
6. Calculate the circumference of this circle.



7. A large bicycle wheel has a **diameter** of 102 cm.
Calculate the circumference of the wheel.



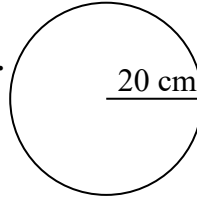
8. A dart board has a **diameter** of 48 cm.
Calculate the circumference of the board.



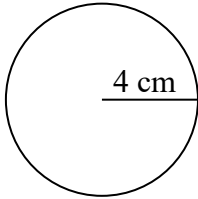
AREA OF A CIRCLE

$$A = \pi r^2$$

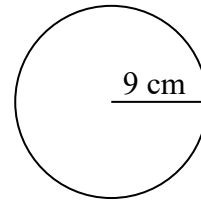
1. Calculate the area of a circle with **radius** 20 cm.



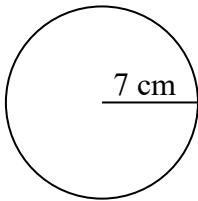
2. Calculate the area of a circle with **radius** 4 cm.



3. Calculate the area of a circle with **radius** 9 cm.

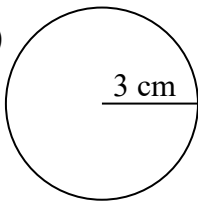


4. Calculate the area of a circle with **radius** 7 cm.

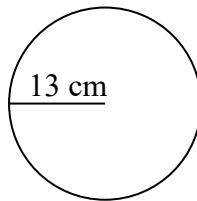


5. Calculate the area of each circle.

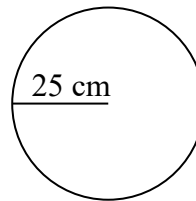
(a)



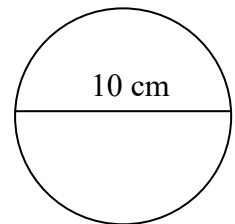
(b)



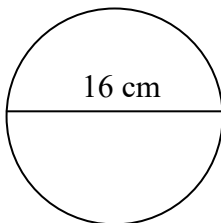
(c)



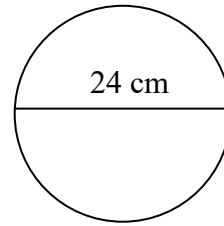
6. Calculate the area of a circle with **diameter** 10 cm (careful).



7. Calculate the area of a circle with **diameter** 16 cm.

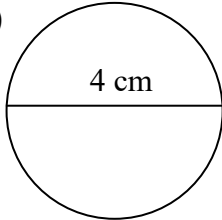


8. Calculate the area of this circle.

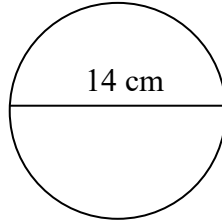


9. Calculate the area of each circle.

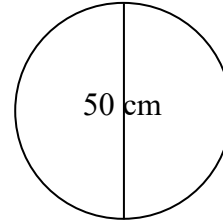
(a)



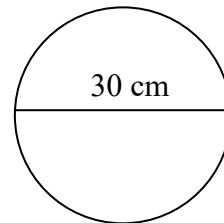
(b)



(c)



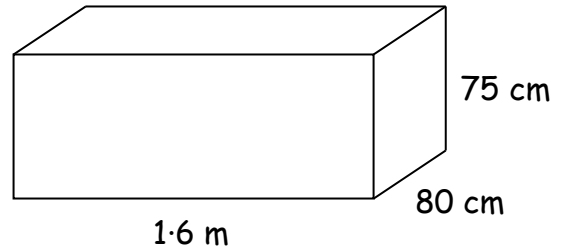
10. The **diameter** of an old vinyl record is 30 cm. Calculate the area of the record.



- (a) Calculate the area of the circle.

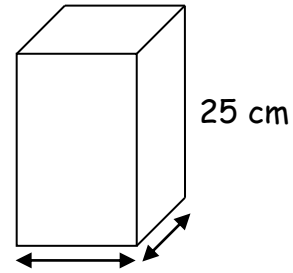
VOLUME

1. Use the formula $V = l \times b \times h$ to calculate the volume of this tank in **litres**.
(Remember that 1 litre = 1000 cm³.)

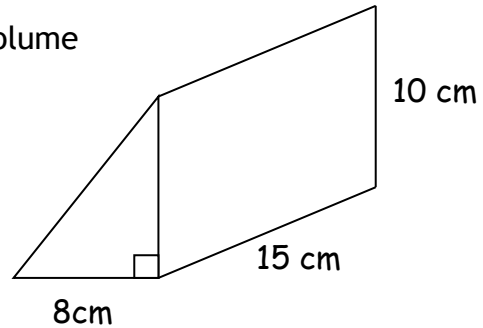


2. The carton shown opposite is in the shape of a cuboid with a **square base** and height 25 cm. The volume of the carton is 3600 cm³.

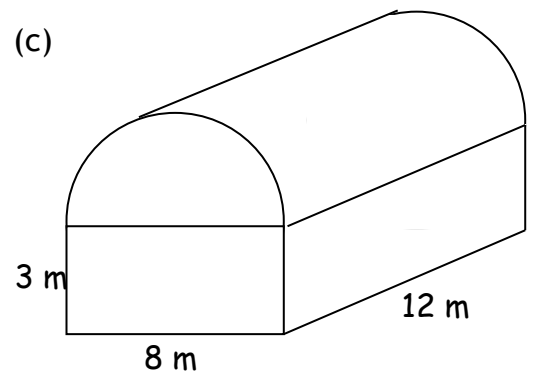
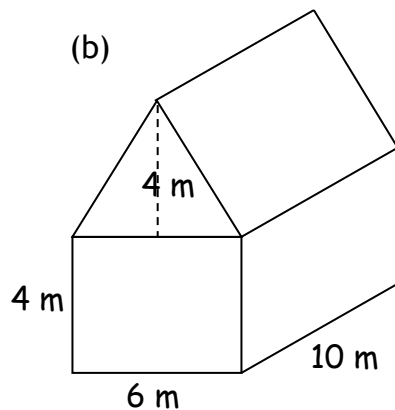
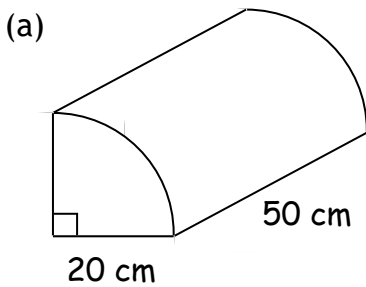
Find the length of one side of the base.



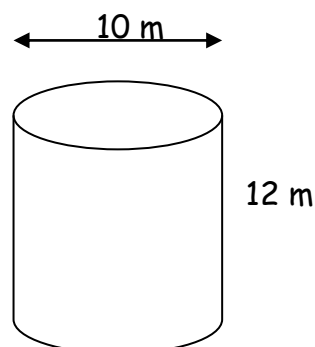
3. Use the formula $V = Al$ to calculate the volume of this triangular prism.



4. Use the formula $V = Al$ to calculate the volume of each prism below.
(Calculate the area of the cross-section first.)



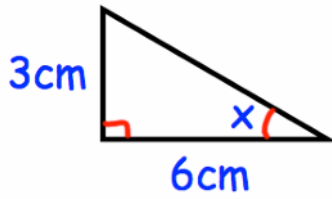
5. Use the formula $V = \pi r^2 h$ to calculate the volume of this cylinder.



Trigonometry

Question 1: Find the size of the missing angles in the triangles below.

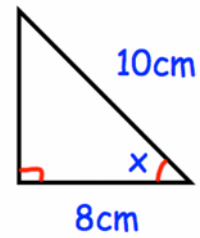
(a)



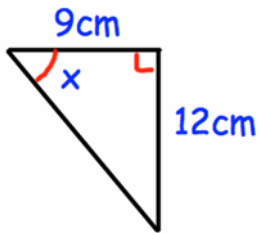
(b)



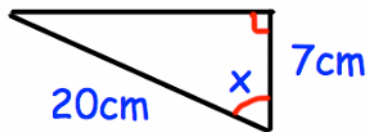
(c)



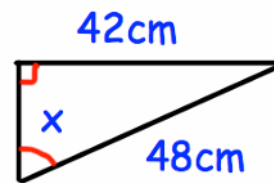
(d)



(e)

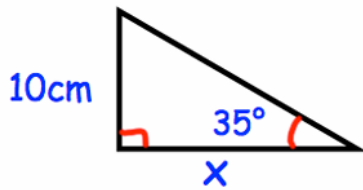


(f)

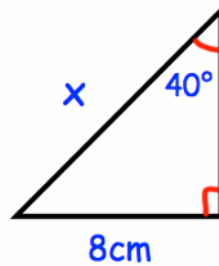


Question 2: Find the lengths of the sides labelled x below.

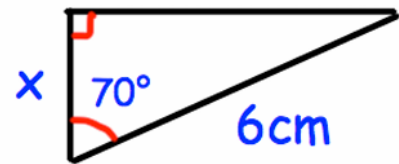
(a)



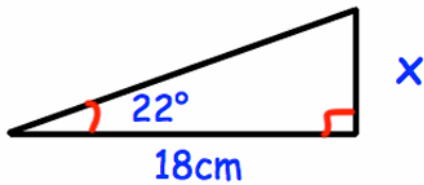
(b)



(c)



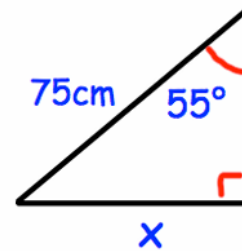
(d)



(e)



(f)



S2 Assessment Revision Solutions (Level 3-4)

Scientific Notation Answers:

- 1a) 7×10^4 b) 3×10^5 c) 8×10^8 d) 9×10^9 f) 3×10^{-5} g) 9×10^{-6} h) 2×10^{-7}
2a) 9.925×10^8 b) 7.08360×10^{-5} c) 5.27×10^{-3} d) 2.7017×10^4 e) 2.6377×10^{-1}
f) 9.218×10^7 g) 4.94×10^5 h) 1.74×10^9 i) 1.580×10^9 j) 2.023340×10^6
3. 5.4×10^6 flights
4. 4×10^{-4} m
5. 5.88×10^{12} miles
6. 1.794×10^7 mm OR 1.794×10^4 m
7. 2.04×10^4 mosquitos

Mixed Questions on Ratio – Answers

1. 5:8 2. 12 women 3. Alex £100, James £60 4. 3:5 5. 80 women
6. Carol £60, Dennis £20 7. 2:7 8. 40 pupils 9. Alison £350, Colin £150
10. 3:5 11. 9:6:5 12. 27000 13. Ed £40, Ted £60, Zed £100
14. Walk 500 km, Cycle 1000 km, Drive 1500km

Proportion Answers:

1. £200 2. £70 3. £150 4. £180 5. £180 6. £3.60
7. £2.25 8. £2.75 9. £2.70 10. £10.35 11. 300g 12. 120sqm
13. 270 words 14. £30 15. 240km 16. 180miles 17. 420times
18. £48 19. 48 litres 20. 420 elephants

Money Answers

- 1a. £8580 b. £8484 c. £96 – Mary earns more 2. £364 3. £1200
3. a. £1200 commission b. £2000 4. £350 5a. £300 b. £1650
6. £122.50 profit

Straight Line Answers

1a) $m = 3$ (0,2) b) $m = 4$ (0,-7) c) $m = 5$ (0,12) d) $m = 4$ (0,-9) e) $m = 5$ (0,0)
f) $m = 1$ (0,2) g) $m = -1$ (0,3) h) $m = -3$ (0,7)

2a) $y = 4x + 3$ b) $y = 2x - 4$ c) $y = 5x - 3$ d) $y = x + 11$ e) $y = -3x + 4$ f) $y = -4x$

3 $y = 2x + 3$ matches with line B

$y = 2x - 3$ matches with line C

$y = x - 3$ matches with line D

$y = -x + 3$ matches with line A

Similar Shapes Answers

1a) $a = 8\text{cm}$ b) $b = 2.5\text{cm}$ c) $c = 10\text{cm}$ d) $d = 5\text{cm}$ e) $e = 8\text{cm}$ f) $f = 2.8125$

2a) $g = 12\text{cm}$ b) MISS OUT

3a) $j = 3$ $k = 7\text{cm}$ b) $m = 2.25\text{cm}$ $n = 18\text{cm}$ c) $q = 1.2\text{cm}$ $p = 8\text{cm}$

Angles in Circles

1 $x = 90^\circ$ $y = 44^\circ$ 2 $x = 90^\circ$ $y = 26^\circ$

3. $A = 90^\circ$ $B = 45^\circ$ $C = 90^\circ$ $D = 55^\circ$ $E = 90^\circ$ $F = 43^\circ$

$G = 90^\circ$ $H = 18^\circ$ $I = 90^\circ$ $J = 63^\circ$ $L = 68^\circ$

4. $a = 90^\circ$ $b = 20^\circ$ $c = 110^\circ$ $d = 90^\circ$ $e = 60^\circ$ $f = 30^\circ$

$g = 25^\circ$ $h = 25^\circ$ $i = 90^\circ$ $j = 65^\circ$ $k = 90^\circ$

$l = 90^\circ$ $m = 45^\circ$ $n = 55^\circ$

Circumference of a circle Answers

1. 18.8 cm 2. 34.6 cm 3. 25.1 cm 4. 62.8 cm
5. 12.6 cm 6. 50.3 cm 7. 320.3 cm 8. 150.7 cm

Area of a circle answers

1. 1256.6 cm² 2. 50.3 cm² 3. 254.5 cm² 4. 153.9 cm²
5.(a) 28.3 cm² (b) 530.9 cm² (c) 1963.5 cm²
6. 78.5 cm² 7. 201.1 cm² 8. 452.4 cm²
9.(a) 12.6 cm² (b) 153.9 cm² (c) 1963.5 cm²
10. 706.9 cm²

Volume answers

1. 960000cm³ = 960litres 2. 12cm 3. 600cm³
4. a. 15707.96cm³ b. 300m³ c. 589.59m³
5. 942.48m³

Pythagoras answers

- 1a. 15 b) 12 c) 50 d) 5 e) 10 f) 5 g) 40 h) 36 i) 75
2. 13 3. 96 4. 90

Trigonometry Answers

Question 1

- (a) 26.57° (b) 15.47° (c) 36.87° (d) 53.13° (e) 69.51° (f) 61.04°

Question 2

- (a) 14.28cm (b) 12.45cm (c) 2.05cm (d) 7.27cm (e) 4.66cm (f) 61.44cm