

Name	
Form	
Teacher	

Maths

Homework Booklet

Year 9c Spring

Section	Hand in by	Score
Numbers		
Using percentages		
Maths and Money		
Rotation and Translation		
Pythagoras' Theorem		
Year 9 Numbers		
Year 9 Using percentages		
Year 9 Maths and Money		
Year 9 Deduction		
Year 9 Rotation and Translation		
Year 9 Pythagoras' Theorem		
Mixed H		
Mixed I		
Mixed J		
Mixed K		
Mixed L		

Numbers

1) a) $4 + (-2) =$ b) $6 + (-7) =$ c) $9 + (-12) =$ d) $(-3) + 7 =$ e) $(-2) + (-4) =$

2) a) $6 - (-2) =$ b) $5 - (-6) =$ c) $(-4) - 2 =$ d) $(-2) - (-4) =$

e) $(-2) - (-2) =$

3) a) $3 \times (-2) =$ b) $5 \times (-4) =$ c) $(-5) \times 6 =$ d) $(-4) \times (-8) =$

e) $(-5) \times (-7) =$

4) Find the Highest Common Factor of 12 and 15.

5) Find the Highest Common Factor of 48 and 72.

6) Find the Lowest Common Multiple of 3 and 5.

7) Find the Lowest Common Multiple of 8 and 12.

8) a) $\frac{2}{5} + \frac{2}{5} =$ b) $\frac{1}{4} + \frac{1}{8} =$ c) $\frac{2}{3} + \frac{5}{8} =$

9) a) $\frac{3}{7} - \frac{2}{7} =$ b) $\frac{8}{9} - \frac{2}{18} =$ c) $\frac{7}{8} - \frac{1}{5} =$

10) a) $\frac{2}{3} \times \frac{1}{5} =$ b) $\frac{3}{8} \times \frac{2}{9} =$ c) $\frac{1}{3} \div \frac{1}{9} =$ d) $\frac{9}{10} \div \frac{3}{5} =$

11) Write 3×10^4 as an ordinary number.

12) Write 600,000,000 in standard form.

13) $2 \times 10^3 \times 5 \times 10^7 =$

14) Sort this list into groups; integers, real numbers, rational numbers. Some numbers may need to go in more than one group. Some numbers may not fit in any group.

$\frac{1}{2}$ $\sqrt{4}$ 5 172 $\sqrt{3}$ $\frac{5}{4}$ $\sqrt{-9}$ π

Integers

Real

Rational

Using Percentages

1. Converting

Fill in the missing values in the table

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	
$\frac{1}{4}$		
$\frac{3}{4}$		
$\frac{1}{10}$	0.1	
$\frac{7}{10}$		
$\frac{1}{5}$	0.2	
$\frac{3}{5}$		

Convert the following percentages into fractions in their simplest form

- a) 70%
- b) 14%
- c) 48%
- d) 35%

2. Percentage increase and decrease

- a) Increase £60 by 15%
- b) Increase 35kg by 12%
- c) Decrease £40 by 20%
- d) Decrease 15m by 17%

3. Change as a percentage

- a) Conor's hourly pay increases from £4.50 to £5.40. Calculate the percentage increase.
- b) Clare has £520 in her bank account. She takes out some money and has £442 left in her account. What is the percentage decrease?
- c) Caroline is weighing some flour for a recipe. She has 520g of flour but needs 436.8g. What is the percentage decrease?

Maths and Money

- 1a) $£10 + £3 =$ b) $£1.50 + £3.20 =$ c) $£11.23 + £5.49 =$
d) $£5 - £2.50 =$ e) $£11 - £4.50 =$ f) $£13.29 - £4.12 =$

- 2) You have £10 in your pocket and decide to buy a drink which costs £1.50. How much money will you have left?
- 3) Sam has a £5 note and buys two bottles of milk. One milk bottle cost £1.20. How much change will Sam receive?
- 4) You have £3 and you buy chocolate from the shop for four friends and yourself. This comes to £2.50. How much is one chocolate and how much change will you receive?
- 5) Michael has a £20 note and buys three magazines which each cost £3.50. How much change will Michael receive?
- 6) At a swimming pool the entry price for adults is £5 and for children £2.50. How much would it cost for:
- A. 3 adults and 2 children
 - B. 1 adult and 4 children

7)

Burger Meal	£3.20
Hotdog Meal	£2.65
Family Meal	£10
Kids Meal	£1.50
Sides	£2.30

- a) If you have a £20 note, how many Hotdog Meals can you buy?
- b) If Kate buys two Burger Meals and one Kids Meal with a £10 note, how much change will Kate receive?
- c) How much money will I need to buy four sides, three Burger Meals and two Family Meals?
- d) How many friends can have a Hotdog Meal each with £30? Will there be any change?
- 8) You have £100 which you received in birthday money. You decide to buy a top for £22, a cap for £25 and headphones for £45.50. How much change will you receive?
- 9) I buy a sandwich for 80p, I buy two chocolates at 50p each and I buy three cans of drink. If I pay with a £10 note and get £3.40 change, how much was each can of drink?
- 10) You have a £20 note to pay for yourself and one friend at the Cinema. The tickets cost £4.50 and you also buy a drink each for £2.00. How much do you spend at the Cinema? How much change do you receive from your £20?

Rotation and Translation

A shape is translated by the vector $\begin{pmatrix} 0 \\ 4 \end{pmatrix}$

In which direction does the shape move?

Circle your answer.

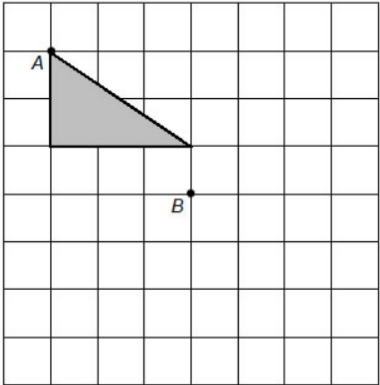
- up down left right

The vector $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$ translates A to B.

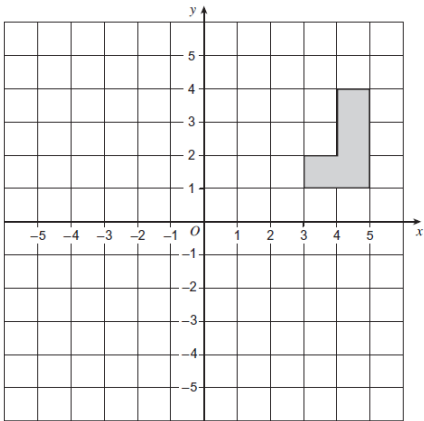
Circle the vector that translates B to A.

- $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$ $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$ $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$ $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$

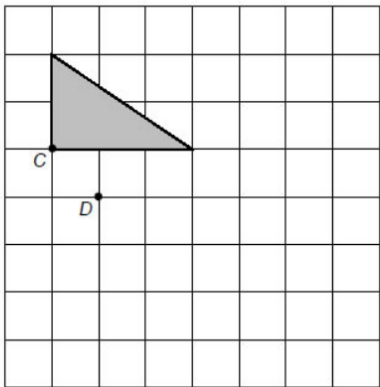
(a) Translate the triangle so that point A moves to point B.



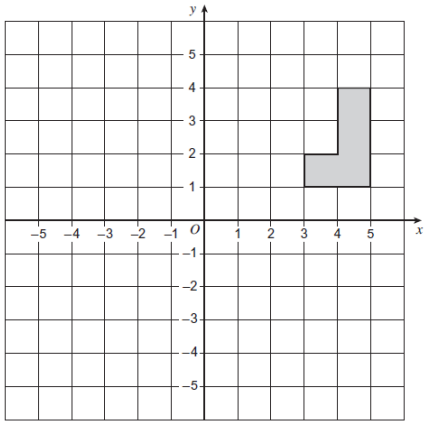
(a) Reflect the shape in the y-axis.



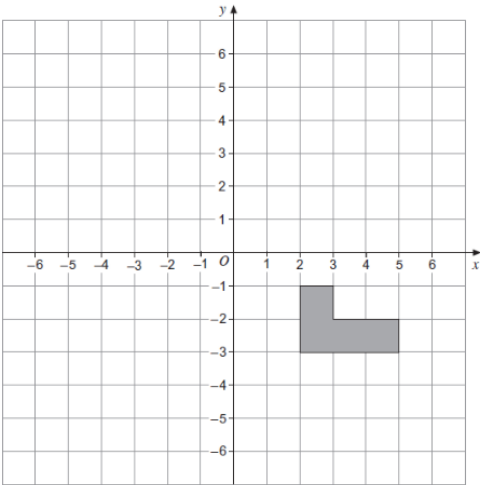
(b) Rotate the triangle 90° clockwise so that point C moves to point D.



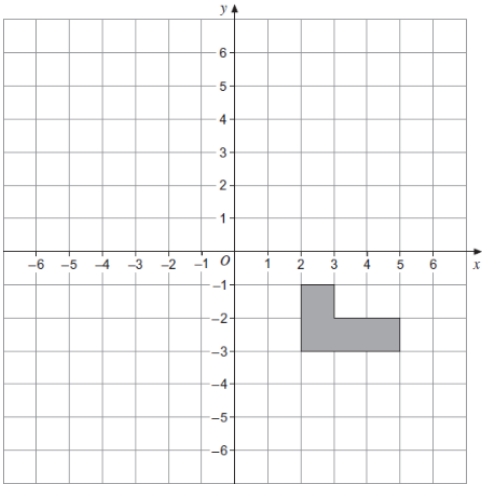
(b) Translate the shape 4 left and 2 down.



(a) Reflect the shape in the line $x = 2$



(b) Translate the shape by the vector $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$.



Pythagoras' Theorem

1a) Evaluate 2^2

b) Calculate 7^2

c) Evaluate 15^2

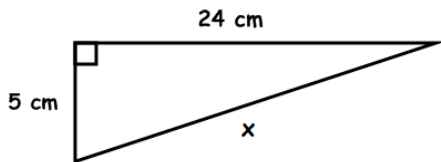
2a) Calculate $2^2 + 4^2$

b) Evaluate $12^2 + 11^2$

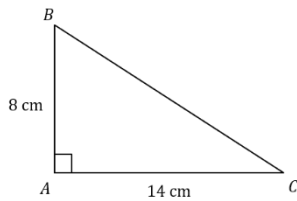
3a) Calculate $13^2 - 10^2$

b) Evaluate $16^2 - 5^2$

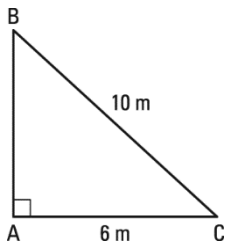
4) Evaluate the length of x



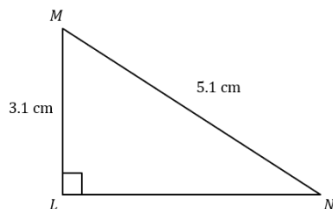
5) Calculate the length BC



6) Evaluate BA



7) Evaluate LN



Year 9

Numbers



Name _____

- 1 Which number is an integer? Circle your answer.

6

4.2

$\frac{3}{4}$

$5\frac{1}{2}$

☐
1 mark

- 2 Work out 196×5

☐
2 marks

- 3 Calculate $\frac{5}{9} + \frac{1}{3}$

☐
2 marks

- 4 Work out the following.

$$-5 + -1$$

☐
1 mark

$$2 - -7$$

☐
1 mark

- 5 $126 = 2 \times 3 \times 3 \times 7$
 $420 = 2 \times 2 \times 3 \times 5 \times 7$

Annie says the highest common factor of 126 and 420 is 7

Explain why Annie is incorrect.

☐
1 mark

Find the highest common factor of 126 and 420

☐
2 marks

- 6 23 451 people attend a rugby match.
8376 of these people are season ticket holders.
How many of these people are not season ticket holders?

☐
2 marks

- 7 Eva has 4 m of ribbon for wrapping gifts.
She needs $\frac{2}{3}$ m for each gift.
How many gifts can Eva wrap?

☐
3 marks

- 8 $p = 8 \times 10^6$ and $q = 4 \times 10^5$

Work out the value of each expression.

$$p - q$$

☐
2 marks

$$\frac{p}{q}$$

☐
2 marks

- 9 Which surd is equal to $2\sqrt{3}$? Justify your answer.

H

$$\sqrt{6}$$

$$\sqrt{12}$$

$$\sqrt{18}$$

☐
1 mark

Total marks

☐

Name _____

- 1 Write $\frac{3}{4}$ as a percentage.

_____ %

1 mark

- 2 Match each statement to the correct calculation.

Increase 20 by 15%

20×0.15

Decrease 20 by 15%

20×1.15

Find 15% of 20

20×0.85

2 marks

- 6 Rosie jumps 32 cm in the air.
Annie jumps 8% higher than Rosie.
How high does Annie jump?

_____ 2 marks

- 7 Dora purchases a kitchen mixer for £425
She pays a 40% deposit and then the remaining
amount is paid in monthly instalments of £17
How many monthly instalments will Dora need to
pay?

_____ 3 marks

- 8 The cost of a laptop increased by 25% between
2015 and 2019
In 2019, the laptop cost £1000
How much did the laptop cost in 2015?

£ _____ 2 marks

- 3 Huan's wage is £10.40 per hour
He receives a 10% pay rise.
What is his new hourly wage?

£ _____ 2 marks

- 4 Tom and Lorna sat the same test.
Tom scored 70% on the test.
Lorna scored 29 out of 40 marks.
Who got the higher score?
Justify your answer.

_____ 2 marks

- 5 Mo spends £15 on ingredients to make 40 cookies.
He sells all 40 cookies for 50p each.
Work out Mo's percentage profit.

_____ % 2 marks

- 9 The average house price in 2007 was 5% lower than in 2006
The average house price in 2008 was 5% greater than in 2007
Explain why the average price of house in 2008 is not the same as the average house price in 2006

1 mark

- 10 A car is purchased for £11 500
In its first year, the value of the car will depreciate by 15%.
Each year after that, the value of the car will depreciate by 10%.
What is the value of the car at the end of 3 years?

£ _____ 3 marks

Total marks

Name _____

1 Here is part of Annie's bank statement.

Date	Description	Credit (£)	Debit (£)	Balance (£)
May 1 st	Opening balance			80.50
May 7 th	Phone bill		40.30	40.20
May 11 th	Cash deposit	22.50		62.70
May 23 rd	Jumpers 'R' Us		17.99	44.71
May 30 th	Bank Transfer	50.00		94.71

What did Annie spend the most on?

 1 mark

Find the total amount of money paid into Annie's account.

£ _____

 1 mark

Work out the difference between Annie's opening and closing balance.

£ _____

 1 mark

5 Two shops sell the same pens.

Tip Top Pens
£1.68 for 10

On Point Pens
£1.98 for 12

Which shop offers better value for money?
Show working to support your answer.

 2 marks

6 An account pays 4% compound interest per year.
Eric invests £1500 into the account for 2 years.
How much interest will he earn?

£ _____

 3 marks

7 Brett buys a drum kit for £1250
He pays a 20% deposit
He is charged 15% interest on the remaining balance and pays this in 10 equal monthly instalments.
How much does Brett pay per month for the drum kit?

£ _____

 3 marks

2 In the UK, the rate of VAT is 20%
The price of a camera excluding VAT is £96
Calculate the price of the camera including VAT.

£ _____

 2 marks

3 Scott earns £7.50 per hour.
He works 8 hours per day, 4 days per week.
How much does Scott earn in a week?

£ _____

 2 marks

4 The exchange rate for British pounds (£) to Indian rupees (₹) is £1 = ₹98

Convert £40 to Indian rupees.

₹ _____

 1 mark

Convert ₹5194 to British pounds.

£ _____

 1 mark

8 The table shows how much tax is applied to income.

Taxable Income	Tax Rate
£12 501 to £50 000	20%
£50 001 to £150 000	40%
Over £150 000	45%

Huan says, "Somebody who earns £40 000 pays £8000 in tax".
Explain why Huan is incorrect.

 1 mark

Work out the total amount of income tax payable on a salary of £75 000

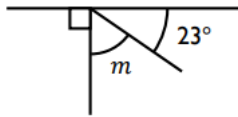
£ _____

 2 marks

Total marks

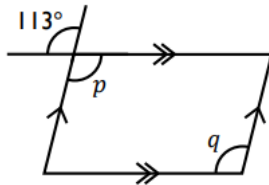
Name _____

- 1 Work out the size of the angles marked with letters.
Give a reason for each answer.



$m = \underline{\hspace{2cm}}^\circ$

☐ 2 marks



$p = \underline{\hspace{2cm}}^\circ$

☐ 2 marks

$q = \underline{\hspace{2cm}}^\circ$

☐ 2 marks

- 4 Decide whether each statement is always, sometimes or never true. Circle your answers.

Opposite angles in a rhombus are equal.

Always **Sometimes** **Never**

☐ 1 mark

A quadrilateral with a pair of parallel sides has at least one line of symmetry.

Always **Sometimes** **Never**

☐ 1 mark

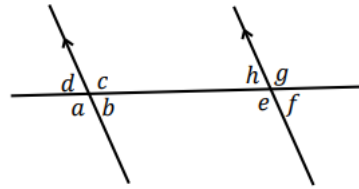
- 5 The angles in a triangle are $(5x - 3)^\circ$, $(9x)^\circ$ and $(3x + 13)^\circ$. Show that the triangle is right-angled.

☐ 3 marks

- 6 Mo says, "a pentagon cannot contain 4 right-angles."
Is Mo's conjecture correct? Justify your answer.

☐ 2 marks

2



Match each statement to the correct reason.

$b = d$

alternate angles are equal

$b = f$

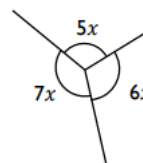
corresponding angles are equal

$b = h$

vertically opposite angles are equal

☐ 2 marks

3



Explain why $18x = 360^\circ$

☐ 1 mark

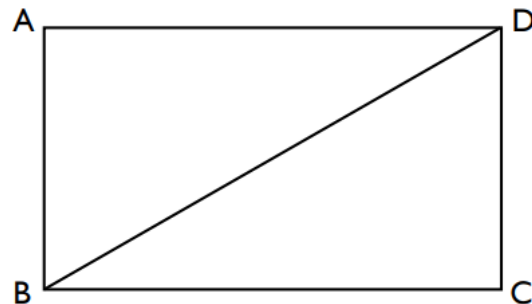
Find the size of the smallest of the 3 angles.

$\underline{\hspace{2cm}}^\circ$

☐ 1 mark

- 7 ABCD is a rectangle.

The perpendicular bisector of BD meets AD at X and BC at Y.
Construct this bisector and label points X and Y.



What is the mathematical name of shape BXDY?

$\underline{\hspace{2cm}}$

☐ 2 marks

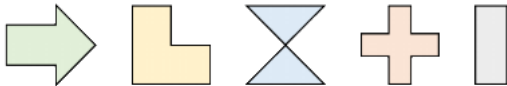
☐ 1 mark

Total marks

☐

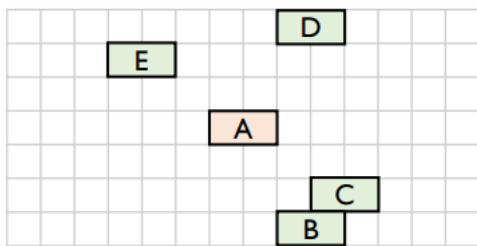
Name _____

- 1 Which shapes have rotational symmetry of order 2?
Tick your answers.



☐ 2 marks

- 2 B, C, D and E are translations of A.



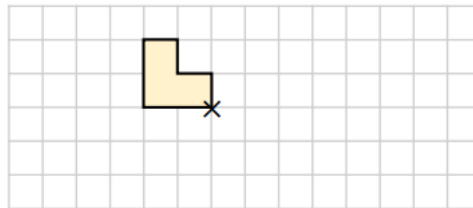
Use B, C, D or E to complete the sentences.

Shape ____ is a translation of A by the vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$.

Shape ____ is a translation of A by the vector $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$.

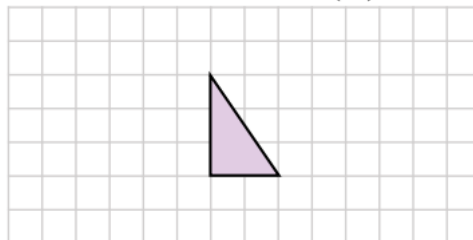
☐ 2 marks

- 3 Rotate the shape 90° anti-clockwise about point X.



☐ 2 marks

- 4 Translate the shape by the vector $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$.



☐ 2 marks

- 5 *The order of rotational symmetry of a shape is equal to the number of lines of symmetry.*

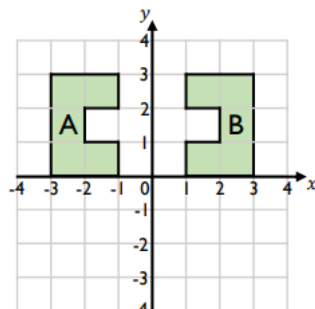
Draw one example that supports this conjecture, and one example to disprove this conjecture.

Support

Disprove

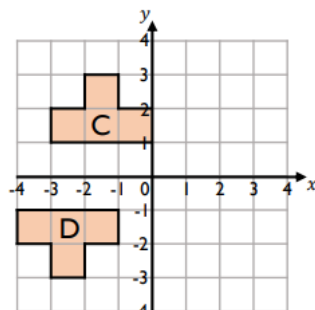
☐ 2 marks

- 6 Describe the transformation that maps shape A onto shape B.



☐ 2 marks

- 7 Describe the transformation that maps shape C onto shape D.

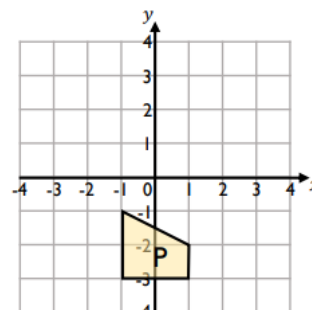


☐ 3 marks

- 8 The coordinates of point F after a translation by the vector $\begin{pmatrix} -4 \\ 3 \end{pmatrix}$ are (5, 8).
Find the coordinates of point F before the translation.

☐ 2 marks

- 9 Shape P is translated by the vector $\begin{pmatrix} -3 \\ 3 \end{pmatrix}$ and then rotated 180° about the origin to give shape Q.
H Draw to show the position of shape Q.



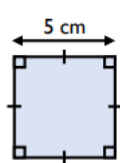
☐ 3 marks

Total marks

☐

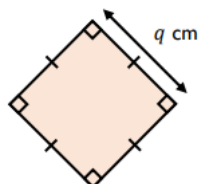
Name _____

- 1 Work out the values of p and q .



Area = $p \text{ cm}^2$

$p =$ _____



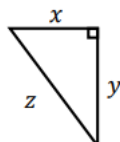
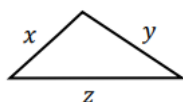
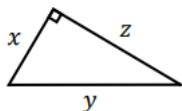
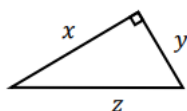
Area = 64 cm^2

$q =$ _____



2 marks

- 2 Tick the triangles for which $x^2 + y^2 = z^2$



2 marks

- 5 A triangle has sides of length 48 mm, 5 cm and 1.4 cm.

Is the triangle right-angled?

Show working to justify your answer.



3 marks

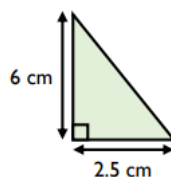
- 6 The point P has coordinates (5, 7)
The point Q has coordinates (-1, -1)
Find the length of the line segment PQ.

_____ units



3 marks

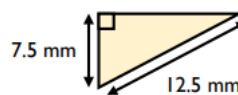
- 3 Calculate the length of the unknown side in each triangle.



_____ cm



2 marks

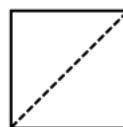


_____ mm



2 marks

- 4 The perimeter of the square is 36 m.
Work out the length of its diagonal.



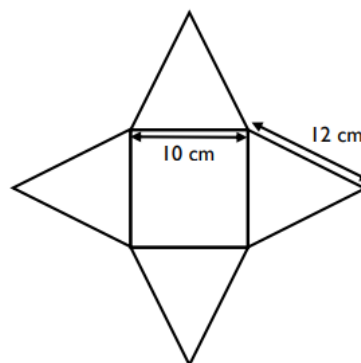
_____ m



3 marks

- 7 Here is the net of a square-based pyramid.

H



Calculate the height of the square-based pyramid.

_____ m



3 marks

Total marks



Mixed H

1. Four times a number is 84. What is the number?		11. In a sale, there is 10 per cent off all prices. A chair costs £81 in the sale. How much was it before the sale?	
2. <input type="text"/> - 5 = $69 \div 3$			
3. $(5 \times 7) + (? - 6) = 56$		12. What is the median of these numbers? 2, 3, 3, 6, 7, 1, 2	
4. What is the product of 0.8 and 7?			
5. What is the remainder when forty-seven is divided by four?		13. Joe has some pocket money. He spends 50% of it. He then spends another £1.50. He has 75p left. How much pocket money did he have?	
6. What number is half-way between 14 and 42?			
7. The coordinates of a square are; (4,4), (4,8), (8,8) and (?,?)		14. Calculate the perimeter of a rectangle with sides 9cm and 13cm.	
8. What is twenty-seven multiplied by five?			
9. $168 \div 3 =$		15. A film starts at twenty-five past eleven in the morning and lasts for 1hour and 15 minutes. What time does it finish?	
10. Subtract one point nine from three point one.			

Mixed I

1. Four times a number is 320. What is the number?		11. In a sale, there is 50% off all prices. A chair costs £13.60 in the sale. How much was it before the sale?	
2. <input type="text"/> - 16 = 75 ÷ 3			
3. (54 ÷ 6) + (8 x 3) =		12. What is the median of these numbers?	
4. Divide seventy-two by eight.		18 , 16 , 23 , 7 , 11	
5. What is the remainder when sixty-two is divided by seven?		13. A packet of biscuits costs 45 pence. Josh buys three packets. How much change does he get from two pounds?	
6. What number is half-way between twenty-one and sixty-three?			
7. The coordinates of a square are; (1,7), (1,1), (7,1) and (?,?)		14. Calculate the perimeter of a square which has a side of 3.5cm	
8. How many thirties are there in two hundred and forty?			
9. What is twenty-six multiplied by three?		15. How would a quarter past three in the afternoon be shown on a twenty-four hour digital clock?	
10. What is double 14.6?			

Mixed J

1. Nine times a number is 72. What is the number?		11. In a sale, there is twenty-five per cent off all prices. A tv costs £120 in the sale. How much was it before the sale?	
2. <input type="text"/> + 15 = 240 ÷ 4			
3. (8 x 7) - (4 x 3) =		12. What is the range of these numbers? 8 , 4 , 9 , 2 , 3	
4. What is 48 divided by 8?			
5. What is the remainder when forty-nine is divided by six?		13. A packet of biscuits costs 68p. Chris buys two packets. How much change does he get from two pounds?	
6. What number is half-way between six and thirty-two?			
7. The coordinates of a square are; (5,2), (8,2), (8,5) and (?,?)		14. Calculate the perimeter of a regular pentagon which has a side of 12 cm.	
8. What is twenty-three multiplied by five?			
9. 132 ÷ 3 =		15. A tv programme starts at twenty-five to nine in the evening and lasts for 45 minutes. What time does it finish?	
10. What is double 8.9?			

Mixed K

1. Nine times a number is 360. What is the number?		11. In a sale, there is 25% off all prices. A chair costs £36 in the sale. How much was it before the sale?	
2. $50 - \square 28 + 14$			
3. $(7 \times 3) + (18 \div 2) =$			
4. What is the sum of 30 and 12 divided by 7?		12. What is the mean of these numbers? $2, 5, 4, 9, 5$	
5. What is the remainder when 58 is divided by 7?		13. Joe has some pocket money. He spends a third of it. He has £6 left. How much pocket money did he have?	
6. What number is half-way between thirteen and forty-one?			
7. The coordinates of a square are $(-7,-7), (6,-7), (6,6)$ and $(?,?)$		14. Calculate the perimeter of a rectangle which is 4.6 metres long and 2.4 metres wide.	
8. How many twenties are there in two hundred?			
9. What is twenty-seven multiplied by six?		15. A tv programme begins at 18: 50 and finishes at 19:25. How long was the programme?	
10. What is double 12.9?			

Mixed L

1. Four times a number is 56. What is the number?		11. In a sale, there is 10 per cent off all prices. A chair costs £63 in the sale. How much was it before the sale?	
2. <input type="text"/> - 5 = 45 ÷ 5			
3. (6 x 7) + (? - 6) = 60		12. What is the median of these numbers? 5 , 2 , 3 , 6 , 7 , 1	
4. What is the product of 0.9 and 7?			
5. What is the remainder when forty-seven is divided by six?		13. Joe has some pocket money. He spends 50% of it. He then spends another £1.20. He has 50p left. How much pocket money did he have?	
6. What number is half-way between 12 and 56?			
7. The coordinates of a square are; (4,4), (4,6), (6,6) and (?,?)		14. Calculate the perimeter of a rectangle with sides 5cm and 12cm.	
8. What is twenty-four multiplied by six?			
9. 171 ÷ 3 =		15. A film starts at twenty past eleven in the morning and lasts for 1 hour and 25 minutes. What time does it finish?	
10. Subtract one point eight from three point five.			