

Year 10 Revision Material

Booklet 1

Q1-17 → 3D Shapes, Area and Pythagoras

Q18-33 → Fractions, Percentages and Money

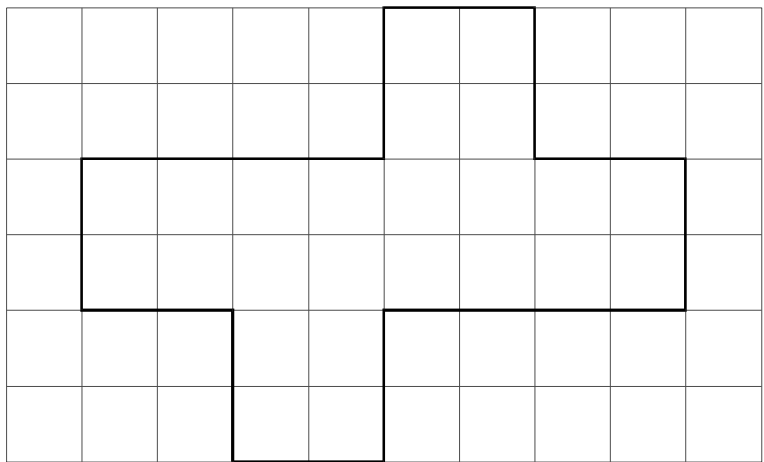
Q34-37 → Ratio and Proportion

Q32-52 → Area of Compound shapes, circles and sectors

Q53-75 → Algebra (simplifying, equations, brackets, factorising, trial & improvement)

Q76-90 → Transformations

1. A net of a shape is drawn on the grid.



- (a) What is the name of the shape?

Answer

(1)

- (b) Each square on the grid is 1 cm long.

- (i) What is the perimeter of the net?

.....

Answer cm

(1)

- (ii) What is the area of the net?

.....

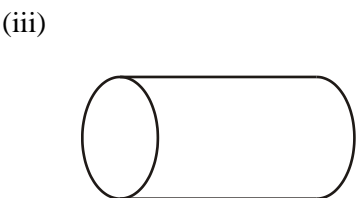
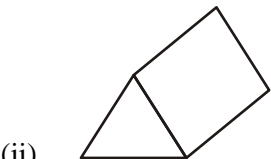
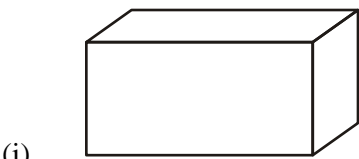
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Answer

(2)

2. (a) Write down the name of each of these 3-D shapes,



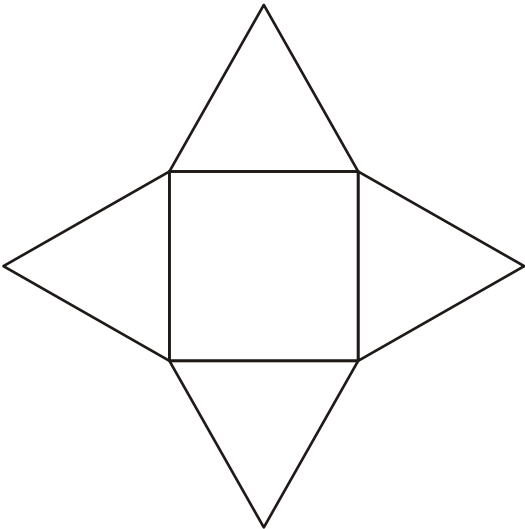
Answer (i)

(ii)

(iii)

(3)

(b) Here is a net for another 3-D shape.

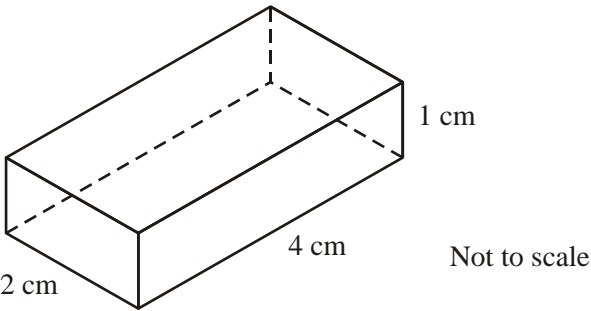


Write down the name of this 3-D shape.

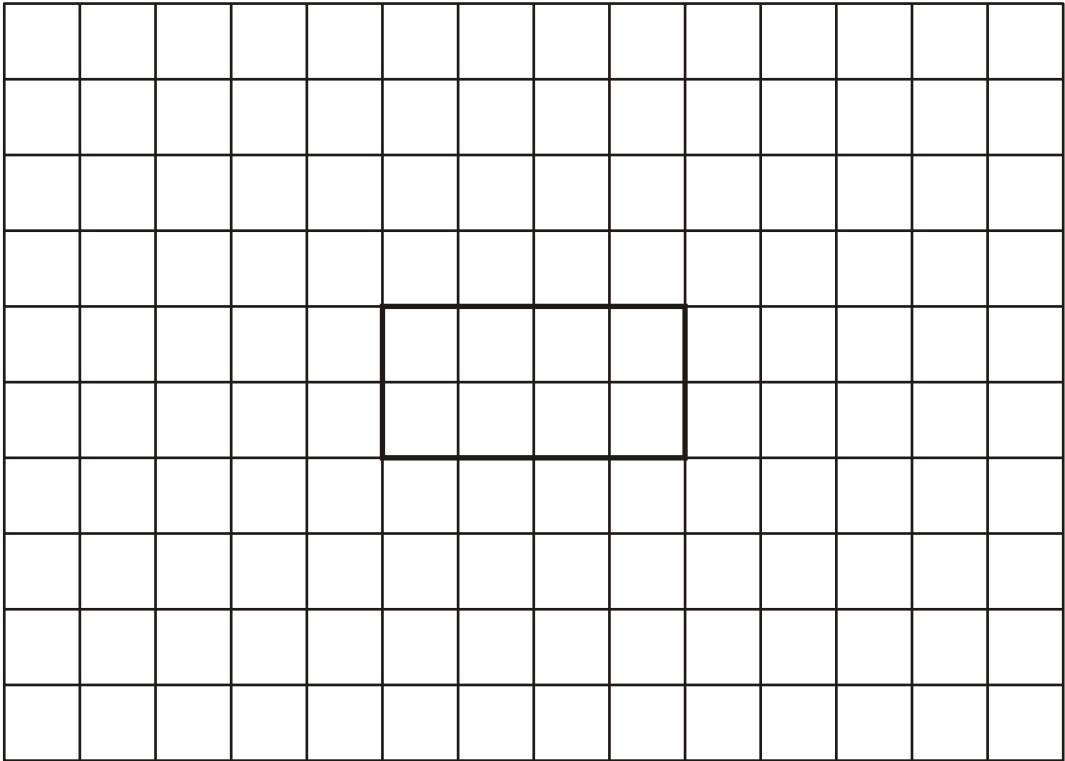
Answer

(1)

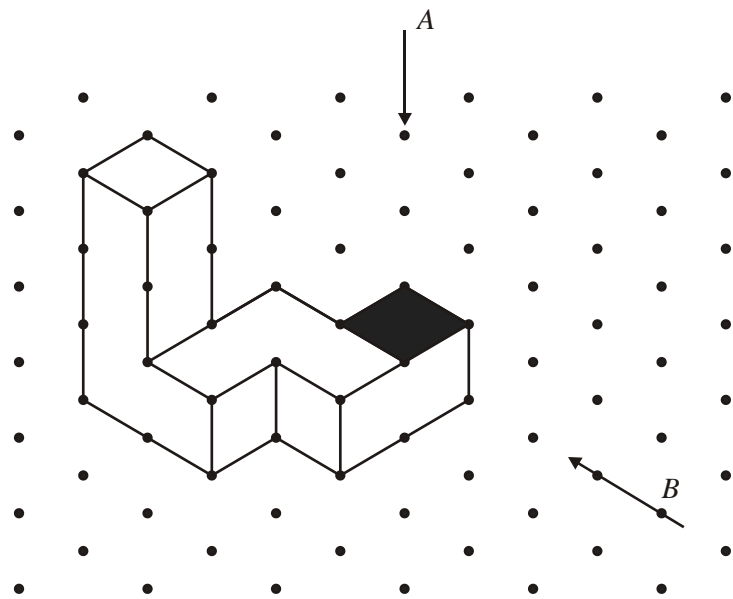
3. The diagram shows a cuboid 4 cm by 2 cm by 1 cm.



On the centimetre grid below, complete the net of the cuboid.



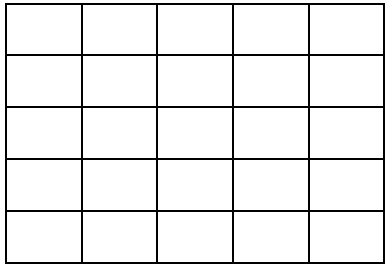
4. This 3-D shape is made from seven cubes.
It is drawn on an isometric grid.



- (a) Tim looks down on the shape from *A*.
One of the faces of a cube that he sees is shaded.
Shade all the other faces that he sees.

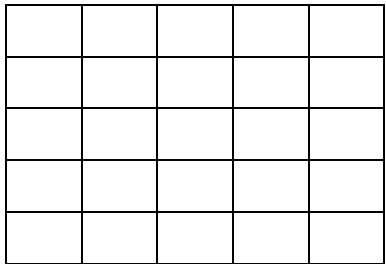
(1)

- (b) On this grid draw the plan from *A*.



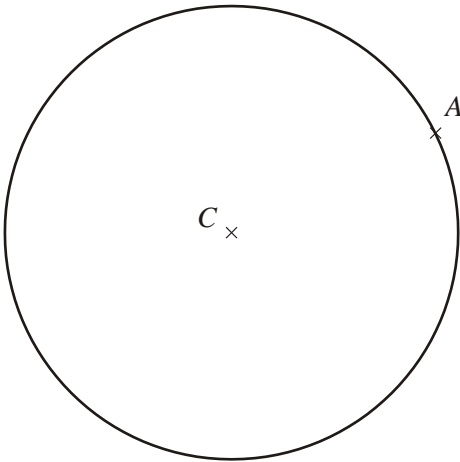
(1)

- (c) On this grid draw the front elevation from *B*.



(1)

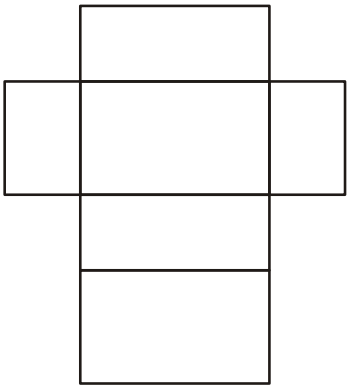
5. (a) C is the centre of the circle and A is a point on the circumference.



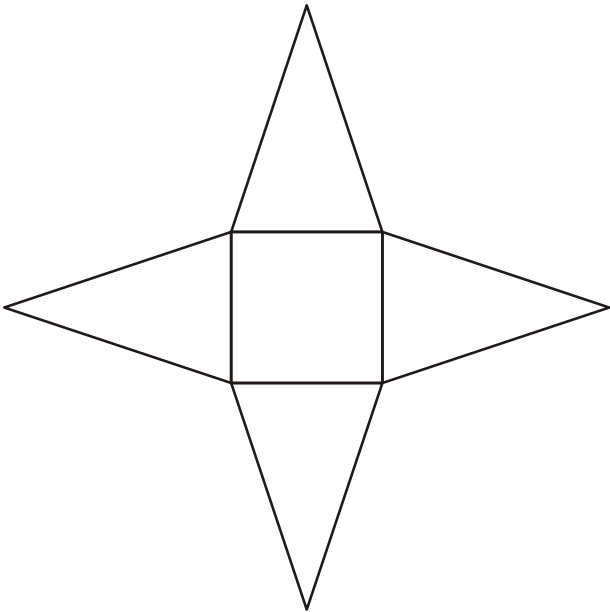
- (i) Draw the diameter from A .
(ii) Draw the tangent at A .

(2)

- (b) These are the nets of two solids.



Net A



Net B

What are the names of the solids?

Answer Net A

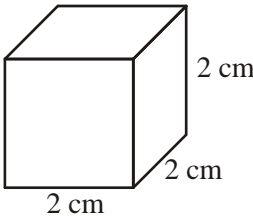
Net B

(2)

6. Draw a sketch of a prism with a triangular cross-section.

(Total 2 marks)

7. The diagram shows a cube of side 2 cm.



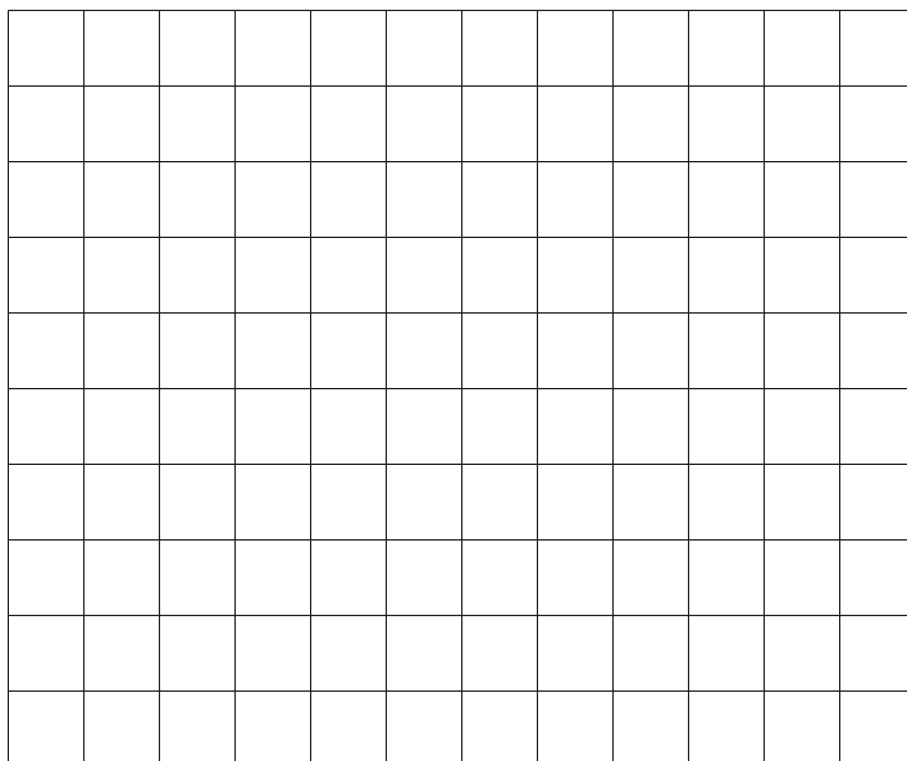
Not to scale

(a) How many faces does a cube have?

Answer

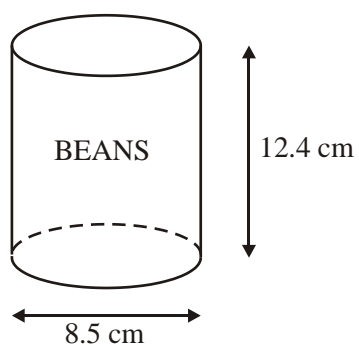
(1)

(b) Draw an accurate net of this cube on the grid below.



(3)

8. The diagram shows a cylindrical tin of beans of diameter 8.5 cm and height 12.4 cm.



Not drawn accurately

Calculate the volume of the cylinder.
State the units of your answer.

.....

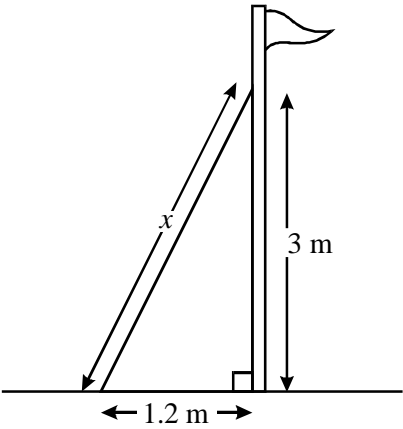
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Answer

(4)

9. A support for a flagpole is attached at a height of 3 m and is fixed to the ground at a distance of 1.2 m from the base.



Not to scale

Calculate the length of the support (marked x on the diagram).

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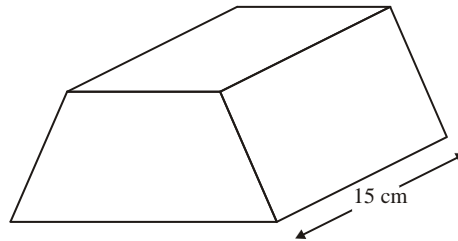
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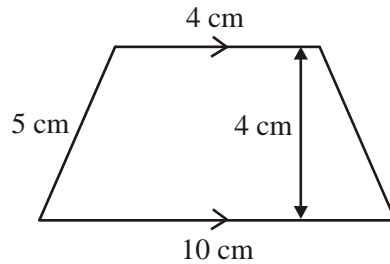
Answer m

10. The diagram shows a silver bar.



Not to scale

The cross-section of the silver bar is a trapezium. (Area = $\frac{1}{2} (a+b) \times h$)



Not to scale

- (a) Calculate the area of the cross-section.

.....

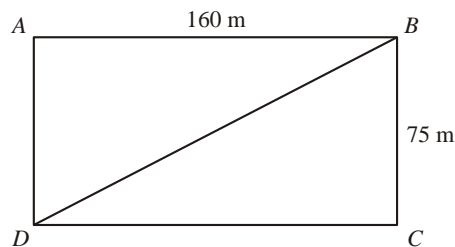
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Answer cm²

(2)

11. A rectangular field $ABCD$ is shown.
The length of the field, $AB = 160$ m.
The width of the field, $BC = 75$ m.



Calculate the length of the diagonal BD .

Give your answer to a suitable degree of accuracy.

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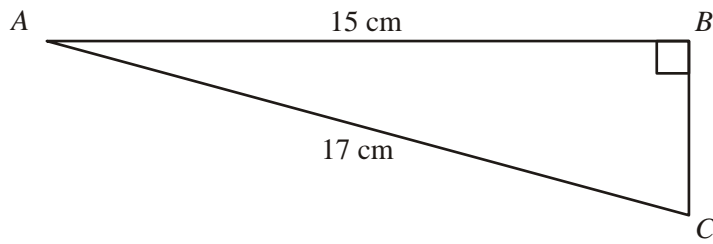
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Answerm

(Total 4 marks)

12. ABC is a right-angled triangle.
 $AB = 15\text{ cm}$, $AC = 17\text{ cm}$



Not drawn accurately

Calculate the length of the side BC .

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.....

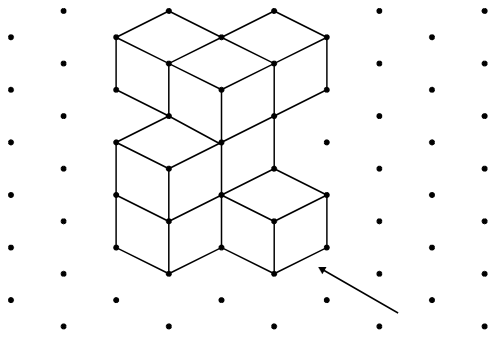
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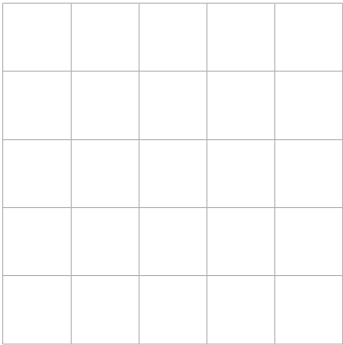
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Answer cm
 (Total 3 marks)

- 13.

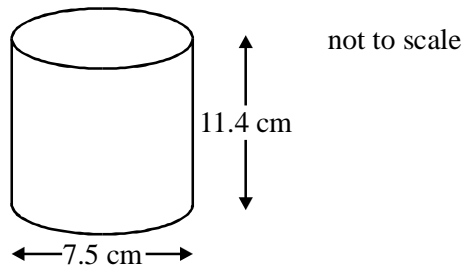


On the grid below, draw and shade in the elevation of the solid from the direction shown by the arrow.



(Total 2 marks)

14. A cylindrical can of soup has a diameter of 7.5 cm.
It is 11.4 cm high.



Calculate the volume of the can.

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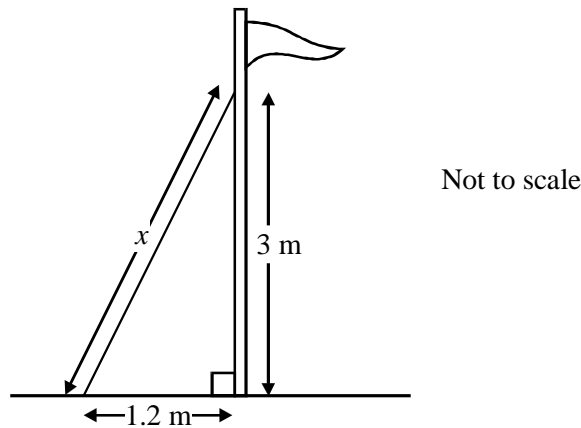
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Answer.....

(Total 4 marks)

15. A support for a flagpole is attached at a height of 3 m and is fixed to the ground at a distance of 1.2 m from the base.



Calculate the length of the support (marked x on the diagram).

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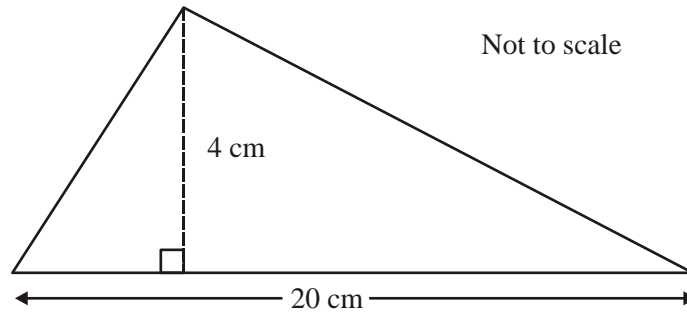
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Answer m

(Total 3 marks)

16. (a) The diagram shows a triangle with base 20 cm and perpendicular height 4 cm.



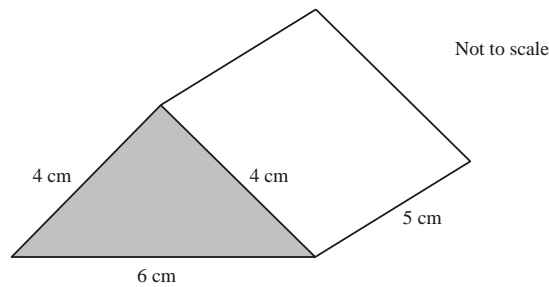
Calculate the area of the triangle.
State the units of your answer.

.....

Answer

(3)

- (b) The diagram shows a triangular prism.



- (i) Sketch the plan view of the prism.

(1)

- (ii) The area of the cross-section is 9.1 cm^2 .

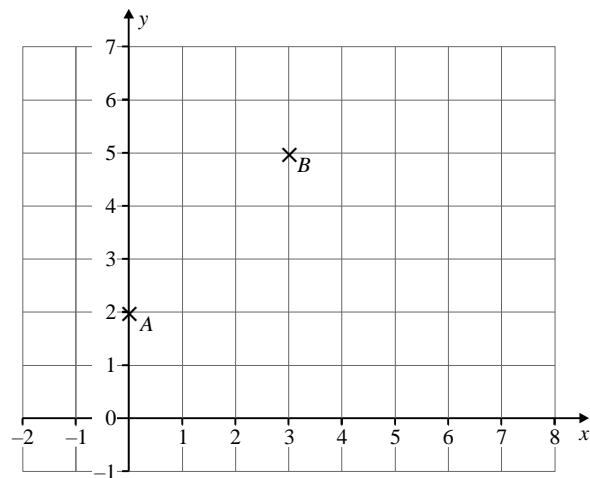
Work out the volume of the triangular prism.

Answer cm^3

(2)

(Total 6 marks)

17.



A is the point (0,2) and B is the point (3,5).

(a) Find the **exact** length of AB.

.....

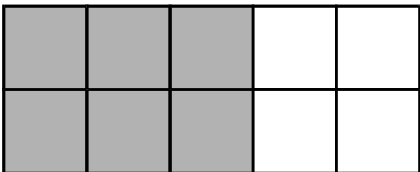
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Answer

(2)

18. (a) What fraction of this shape is shaded?
Give your answer in its simplest form.



.....

Answer

(2)

(b) Find $\frac{7}{10}$ of £50

.....

.....

Answer £

(2)

- (c) Find 30% of 200 metres.

.....
.....

Answer metres

(2)

- (d) Work out $\frac{1}{2} + \frac{1}{5}$

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.....
.....

Answer

(2)

19.

60% of £40

$\frac{2}{5}$ of £55

Which is the larger amount?

You **must** show your working.

.....
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.....
.....
.....

Answer

(Total 4 marks)

20. Mr and Mrs Smith are buying a washing machine.



How much do they save in the sale?

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.....

Answer £

(Total 2 marks)

21. (a) Andy has a part-time job.
He is paid £31.50 for working from 8.00 am to 3.30 pm.
How much is this per hour?

.....

.....

.....

Answer £

(2)

- (b) Andy is saving for a bike that costs £150.
What percentage is £31.50 of £150?

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.....

Answer %

(2)

22. (a) Calculate 36% of £420.

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.....
.....

Answer £ (2)

(b) What percentage is £84 of £240?

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.....
.....

Answer % (2)

23. Jim buys furniture for £74.40.
Delivery will cost Jim an extra 5%.

How much is the delivery charge?

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.....
.....

Answer £ (Total 2 marks)

24. Work out 70% of 90.

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.....
.....

Answer (Total 2 marks)

25. Mrs Brown’s bill for servicing her car is £96 plus VAT.
VAT is charged at 17.5%.

What is her total bill?

.....
.....
.....

Answer £ (Total 3 marks)

26. The price of a computer is £840.
In a sale the price is reduced by 15%.

What is the sale price?

.....
.....

Answer £

(Total 3 marks)

27. Find $17\frac{1}{2}\%$ of £174.80

.....
.....
.....

Answer £

(Total 2 marks)

28. Beth has 400 roses.
48 are yellow.

What percentage of the roses are yellow?

.....
.....

Answer %

(Total 2 marks)

29. Suzi buys a computer in a sale.
The original price of the computer was £650.



How much money does Suzi save?

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.....
.....

Answer £

(Total 2 marks)

30. Joe wants to buy a pack of 10 CDs.
He sees two offers.

PRICECUT
Pack of 10 CDs
£7.70
plus 17.5% VAT

SAVERSTORE
Pack of 10 CDs
£8.99
including VAT

Which of these two packs is the cheaper?
You **must** show all your working.

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(Total 3 marks)

31. Annie invests £3000 for 5 years in a savings account that pays 4% compound interest per year.
How much will she have in the account at the end of 5 years?

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.....

.....

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Answer £

32. Jane earns £11 400 per year.
After her pay rise she earns £12 198 per year.

What was her percentage pay rise?

.....

.....

Answer %

(Total 3 marks)

33. A shop advertises a special offer.

Portable Television

Was £90

Now £69



Find the percentage reduction in the cost of the television.

.....

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.....

.....

Answer %
(Total 3 marks)

34. The table shows the amounts needed to make 36 mince pies.

Ingredient	Amount for 36 pies	Amount for 48 pies
Plain Flour	330 g	
Lard	75 g	
Butter	75 g	
Mincemeat	720 g	

Calculate the amounts needed to make 48 mince pies.
Put your answers in the table.

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.....

.....

(Total 3 marks)

35. The town of Axon has 35 600 houses.
 The ratio of detached houses to other types of houses is 1: 4
 How many detached houses are there?

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.....

.....

Answer
 (Total 2 marks)

36. (a) In 2002 the town of Axon had 35 600 houses.
 The ratio of detached houses to other types of houses was 1 : 4
 How many detached houses were there?

.....

.....

.....

Answer
 (2)

- (b) In 2003 the town of Axon had 36 200 houses.
 What was the percentage increase in the number of houses from 2002 to 2003?

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Answer %
 (3)
 (Total 5 marks)

37. The cost of 30 bottles of water is £21.
 What is the cost of 45 bottles of water?

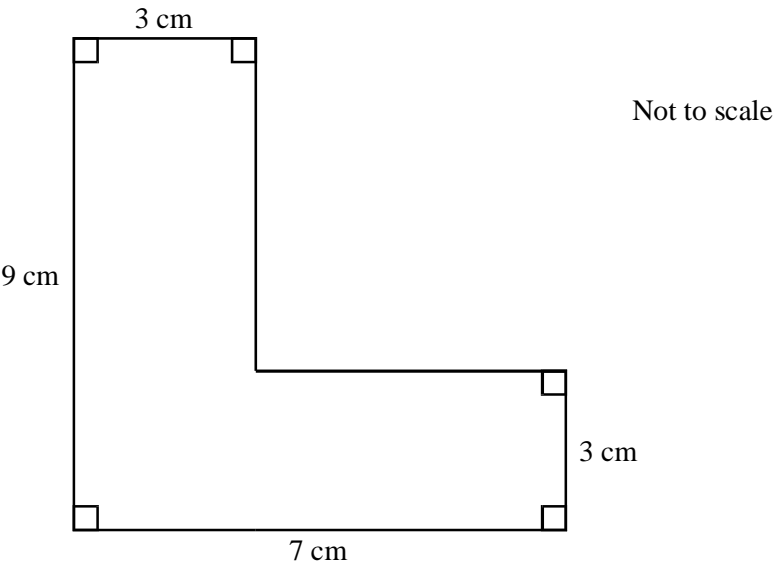
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Answer
 (Total 3 marks)

38. Calculate the area of this shape.



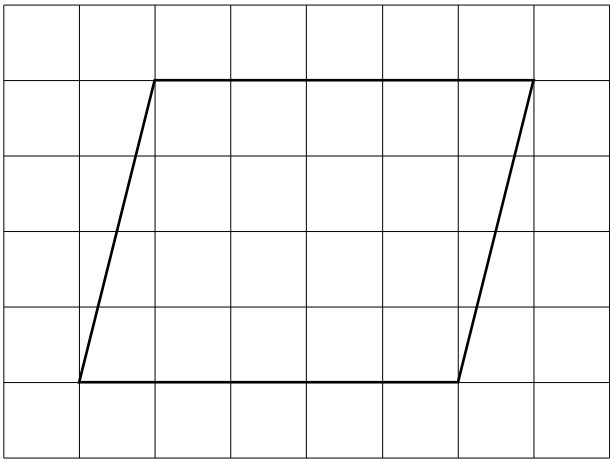
You **must** show all your working.

.....

.....

Answer cm^2
(Total 3 marks)

39. A parallelogram is drawn on a centimetre square grid.



Calculate the area of the parallelogram.

.....

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Answer cm^2
(Total 2 marks)

40. A circular pond has a radius of 2.2 m.

(a) Calculate the circumference of the pond.

.....
.....

Answer m (2)

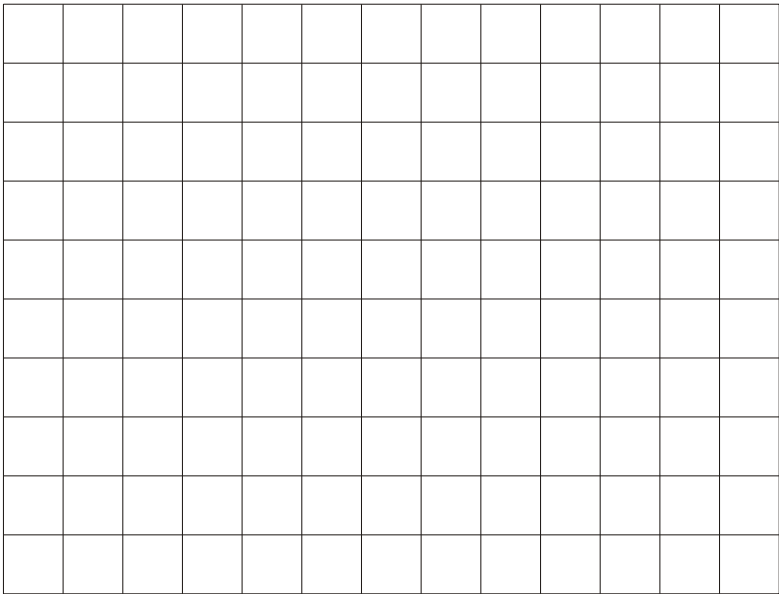
(b) Calculate the area of the pond.

.....
.....

Answer (3)

41. A rectangle has an area of 40 cm^2 and a perimeter of 26 cm.
Find the length and width of the rectangle.
You may use the grid to help you.

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Answer Length cm
Width cm
(Total 2 marks)

42. (a) Calculate the area of a circle of radius 8 cm.

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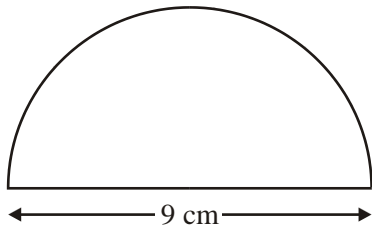
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Answer

(3)

(b) A semi-circular protractor has a diameter of 9 cm.



Not drawn accurately

Calculate the perimeter.

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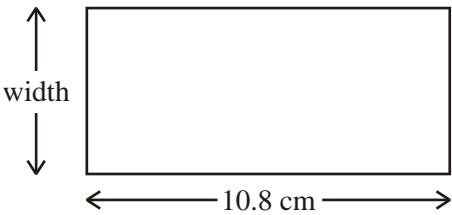
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Answer cm

(3)

(Total 6 marks)

43. The length of a rectangle is 10.8 cm.
The perimeter of the rectangle is 28.8 cm.



Not to scale

Calculate the width of the rectangle.

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.....

Answer cm

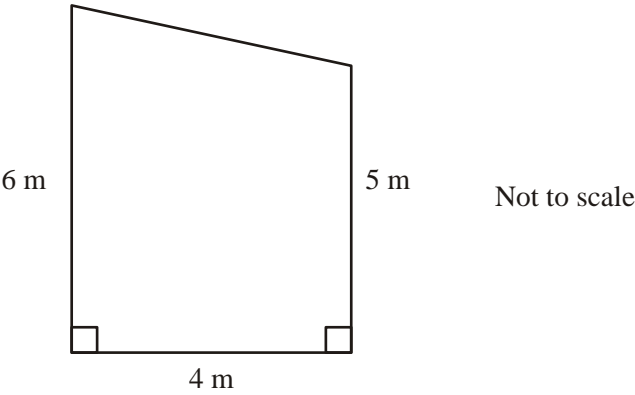
(Total 3 marks)

44. A circular dish has a diameter of 9 cm. Calculate the circumference of the dish.

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Answer cm
(Total 2 marks)

45. The diagram shows the side wall of a building.

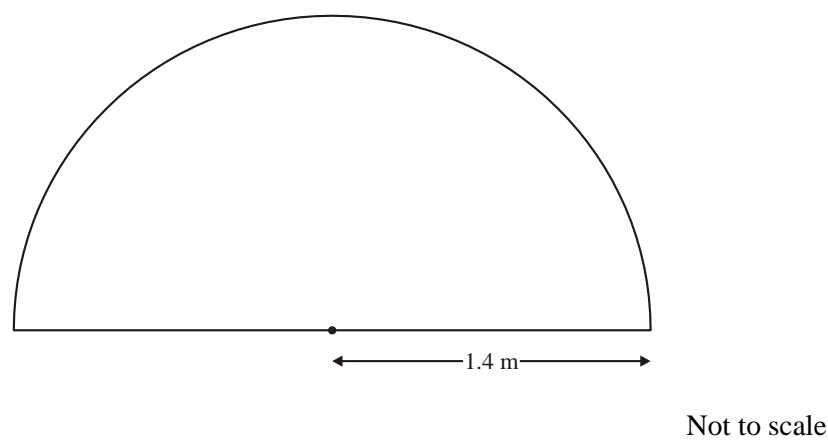


Calculate the area of the wall.
You **must** show all your working.

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Answer
(Total 4 marks)

46. Jasmin has a pond in her garden.
The surface of the pond is a semicircle of radius 1.4 m.



- (a) Calculate the area of a semicircle of radius 1.4 m.
You **must** show your working.
State the units of your answer.

.....

.....

.....

.....

Answer

(3)

- (b) The pond is 50 cm deep.
The sides of the pond are vertical.
- Calculate the volume of the pond.
Give your answer in cubic metres.

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.....

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Answer m³

(2)

(Total 5 marks)

47. A circular pond has a diameter of 6 m.
Calculate its circumference.

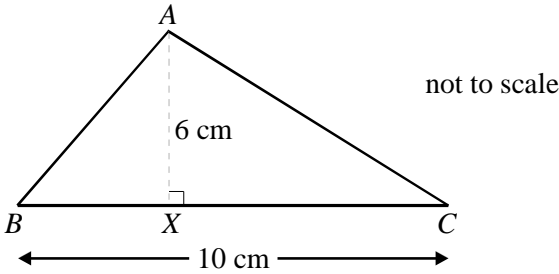
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Answer m
(Total 2 marks)

48. The diagram shows a triangle ABC . The base $BC = 10$ cm.
The perpendicular height $AX = 6$ cm.



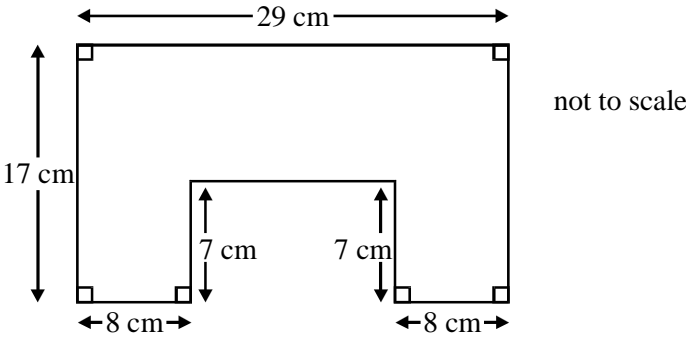
Calculate the area of the triangle.

.....

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Answer.....cm²
(Total 2 marks)

- 49.



Calculate the area of the shape.

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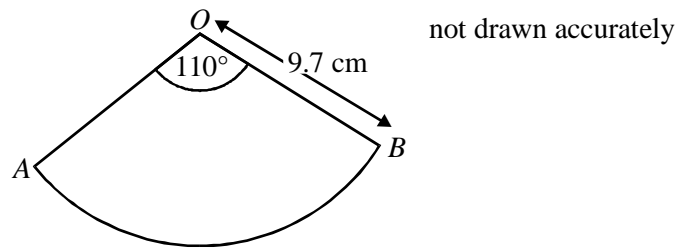
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Answer.....cm²
(Total 3 marks)

50. AB is an arc of a circle, centre O , with radius 9.7 cm .
 Angle $AOB = 110^\circ$.



Calculate the area of the sector OAB .

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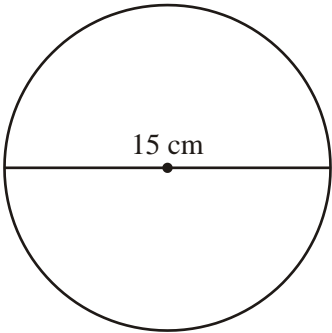
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Answer..... cm^2
 (Total 3 marks)

51. The diameter of a circle is 15 cm .
 Calculate the circumference of the circle.



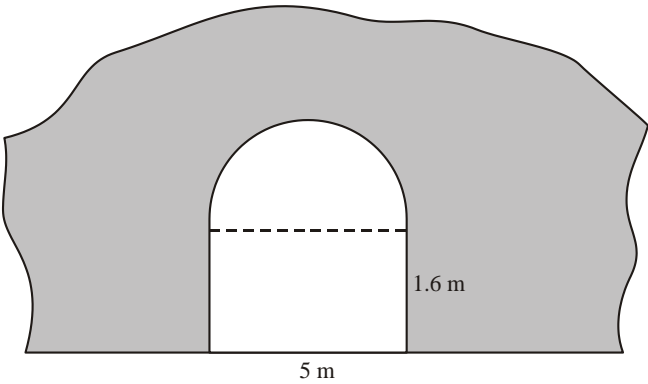
Not drawn accurately

.....

.....

Answer cm
 (Total 2 marks)

52. The sketch shows the entrance to a tunnel.
 The uniform cross-section of the tunnel is in the shape of a semi-circle over a rectangle.



Not to scale

The rectangle is 5 metres wide and 1.6 metres high.
The tunnel is 230 metres long.

Calculate the volume of earth removed in digging the tunnel.

.....

.....

.....

.....

Answer m³
(Total 5 marks)
(Total 3 marks)

53. Solve the equations

(a) $3x = 12$

.....

Answer $x =$

(1)

(b) $y + 7 = 13$

.....

Answer $y =$

(1)

54. Solve the equations

(a) $8z - 5 = 11$

.....

.....

Answer $z =$

(2)

(b) $3(w - 2) = 9$

.....

.....

.....

.....

Answer $w =$

(3)

(Total 5 marks)

55. (a) Simplify $2x + 3y + 5x - 2y - 4x$

.....

.....

.....

Answer

(2)

(b) Factorise $4c + 12$

.....

Answer

(1)

- (c) Factorise $x^2 + 5x$

.....

Answer

(2)

(Total 5 marks)

56. Simplify the following

- (a) $3x + 2x - x$

.....

Answer

(1)

- (b) $5x + 3y - 2x + 4y$

.....

Answer

(2)

- (c) $3 \times a \times 4$

.....

Answer

(1)

(Total 4 marks)

57. Solve these equations

- (a) $4x - 7 = 5$

.....

.....

Answer $x =$

(2)

- (b) $2(y + 5) = 28$

.....

.....

.....

Answer $y =$

(3)

(c) $7z + 2 = 9 - 3z$

.....

Answer $z =$

(3)

(Total 8 marks)

58. Ali is x cm tall.

- (a) Suki is 5 cm taller than Ali.
 Write down an expression in x for Suki's height.

.....

Answer cm

(1)

- (b) Ali's sister is 2 cm shorter than Ali.
 Write down an expression in x for the height of Ali's sister.

.....

Answer cm

(1)

- (c) Ali's father is twice as tall as Ali.
 Write down an expression in x for the height of Ali's father.

.....

Answer cm

(1)

- (d) Darius has a height, in cm, given by the expression $2x - 65$
 He is 115 cm tall.

Solve the equation

$$2x - 65 = 115$$

to find Ali's height.

.....

Answer cm

(2)

(Total 5 marks)

59. Solve the equations.

(a) $\frac{w}{5} = 7$

.....

Answer $w =$

(1)

(b) $4x - 5 = 7$

.....

.....

Answer $x =$

(2)

(c) $5y + 11 = 3(y + 7)$

.....

.....

.....

Answer $y =$

(3)

(Total 6 marks)

60. (a) Expand $d(d^2 + 6)$

.....

Answer

(2)

(b) Simplify $g^4 \times g^4$

.....

Answer

(1)

(c) Expand and simplify $2(p + 5) + 3(2p - 1)$

.....

.....

.....

Answer

(2)

(Total 5 marks)

61. Simplify

(a) $c + 4c + 2c$

.....

Answer

(1)

(b) $d \times d \times d$

.....

Answer

(1)

(c) $3p + 5q - 2p + q$

.....

.....

Answer

(2)

(Total 4 marks)

62. Matt thinks of a number.
He multiplies it by 4 and then takes away 5.
The answer is 39.

What was the number?

.....

.....

Answer

(Total 2 marks)

63. Simplify

(a) $x + 5x - 2x$

.....

Answer

(1)

(b) $7p + 2q - p + 2q$

.....

Answer

(2)

(Total 3 marks)

64. Using trial and improvement, complete the table to find a solution of the equation

$$x^3 - 2x = 90$$

Give your answer to 1 decimal place.

x	$x^3 - 2x$	Comment
4	56	Too low
5	115	Too high

Answer $x =$
(Total 3 marks)

65. (a) Simplify the expression

$$2c + 6d + 4c - 8c$$

.....

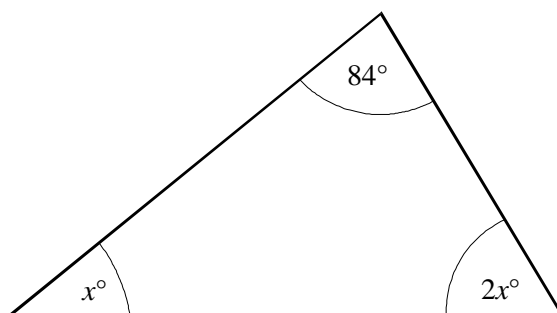
Answer
(2)

(b) Factorise $x^2 + 5x$

.....

Answer
(2)

- (c) The triangle has angles x° , $2x^\circ$ and 84° as shown.
Find the value of x .



Not drawn
accurately

.....

.....

.....

.....

Answer degrees

(3)

(Total 7 marks)

66. Solve the equation $5x + 4 = 3x + 7$

.....

.....

.....

.....

.....

.....

Answer $x =$

(Total 3 marks)

67. (a) Factorise $2x + 6$

.....
.....

Answer.....

(1)

(b) Expand $3(4y + 1)$

.....
.....

Answer.....

(1)

(c) Expand $4x(x^2 + 5)$

.....
.....

Answer.....

(2)

(Total 4 marks)

68. (a) Factorise $x^2 + 4x$

.....
.....

Answer

(b) Make r the subject of the formula $p = 3 + 2r$

.....
.....
.....
.....

Answer $r =$

(2)

(Total 5 marks)

69. (a) Expand and simplify $4(2x - 1) + 3(x + 6)$

.....
.....
.....

Answer (2)

(b) Expand $x^2(4 - 2x)$

.....
.....

Answer (2)
(Total 4 marks)

70. Solve the equations

(a) $4v - 1 = 9$

.....
.....

Answer $v =$ (2)

(b) $3w + 4 = 19 - 2w$

.....
.....
.....

Answer $w =$ (3)

(c) $\frac{x}{5} - 2 = 11$

.....
.....
.....

Answer $x =$ (2)

(d) $4(y + 3) = 9(y - 2)$

.....

.....

.....

.....

.....

Answer $y =$

(3)

(Total 10 marks)

71. Factorise

(a) $4x - 8$

.....

Answer.....

(1)

(b) $y^2 + 2y$

.....

Answer.....

(2)

(Total 3 marks)

72. Expand and simplify

$$5(2x + 1) - 3(x - 4)$$

.....

.....

Answer

(Total 2 marks)

73. Simplify

(a) $m^2 \times m^5$

.....

Answer

(1)

(b) $p^6 \div p^3$

.....

Answer

(1)

(c) $(q^4)^2$

.....

Answer

(1)

(Total 3 marks)

74. (a) Factorise $3x - 6$

.....

Answer

(1)

(b) Factorise $x^2 - 2x$

Answer

(2)

(Total 3 marks)

(3)

75. (a) Simplify

$$10d + 3e - 2d - 7e$$

.....
.....

Answer

(2)

(b) Expand and simplify $(2x - 3)(3x + 5)$

.....
.....

Answer

(3)

(c) Simplify

(i) $y^4 \times y^{-3}$

.....

Answer

(1)

(ii) $y^4 \div y^5$

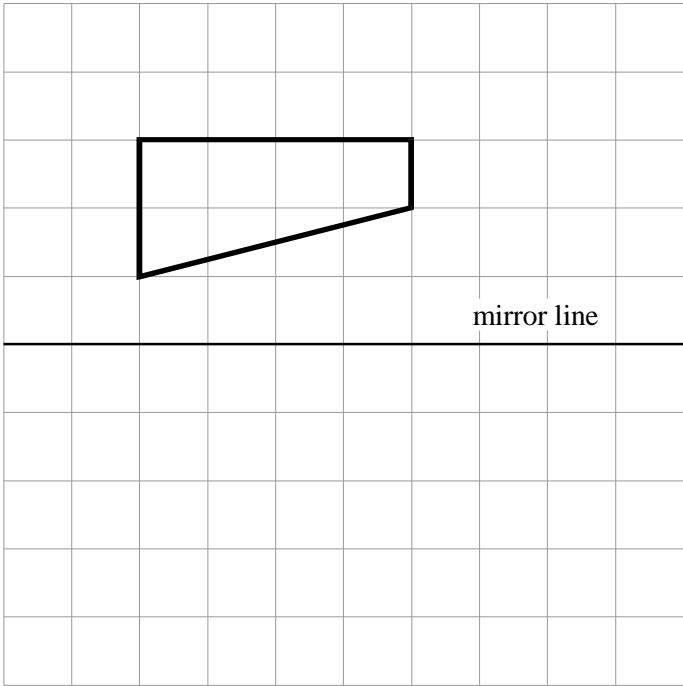
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Answer

(1)

(Total 7 marks)

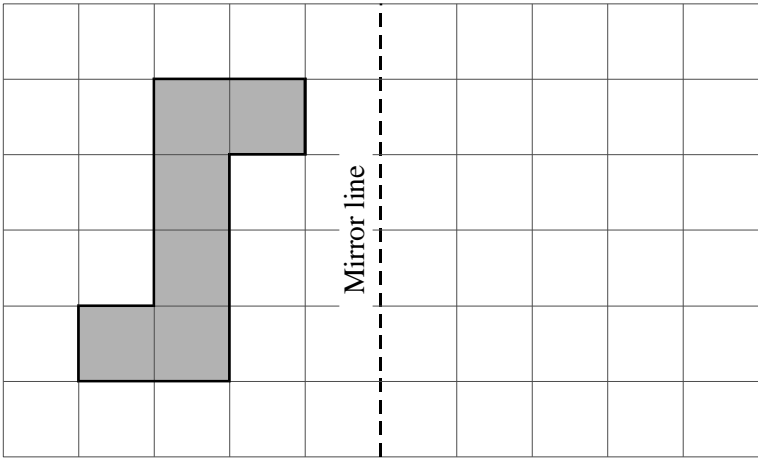
76.



Draw the reflection of the shape in the mirror line.

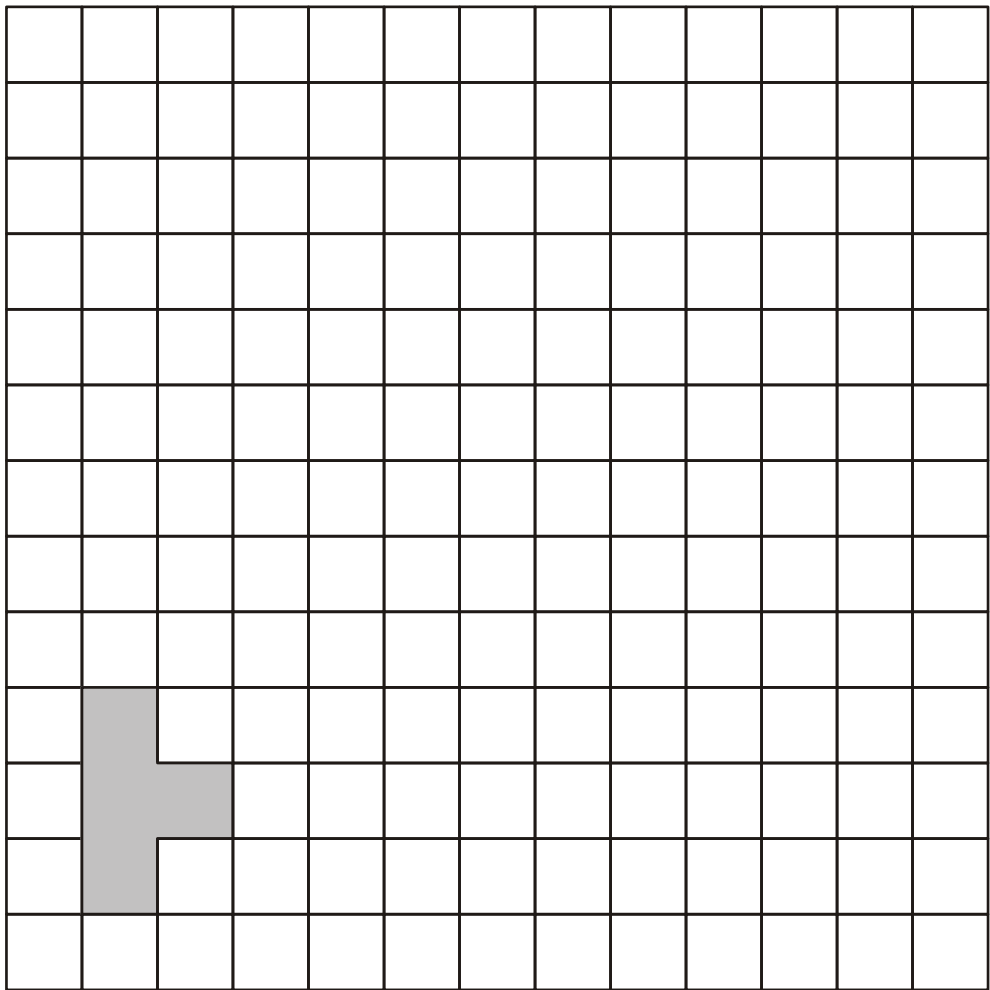
(Total 2 marks)

77. Draw the reflection of the shape in the mirror line.



(Total 2 marks)

78. (a) Enlarge the shaded shape by a scale factor of 3.



(2)

(b) How many times bigger is the area of the enlarged shape than the area of the small shape?

.....

.....

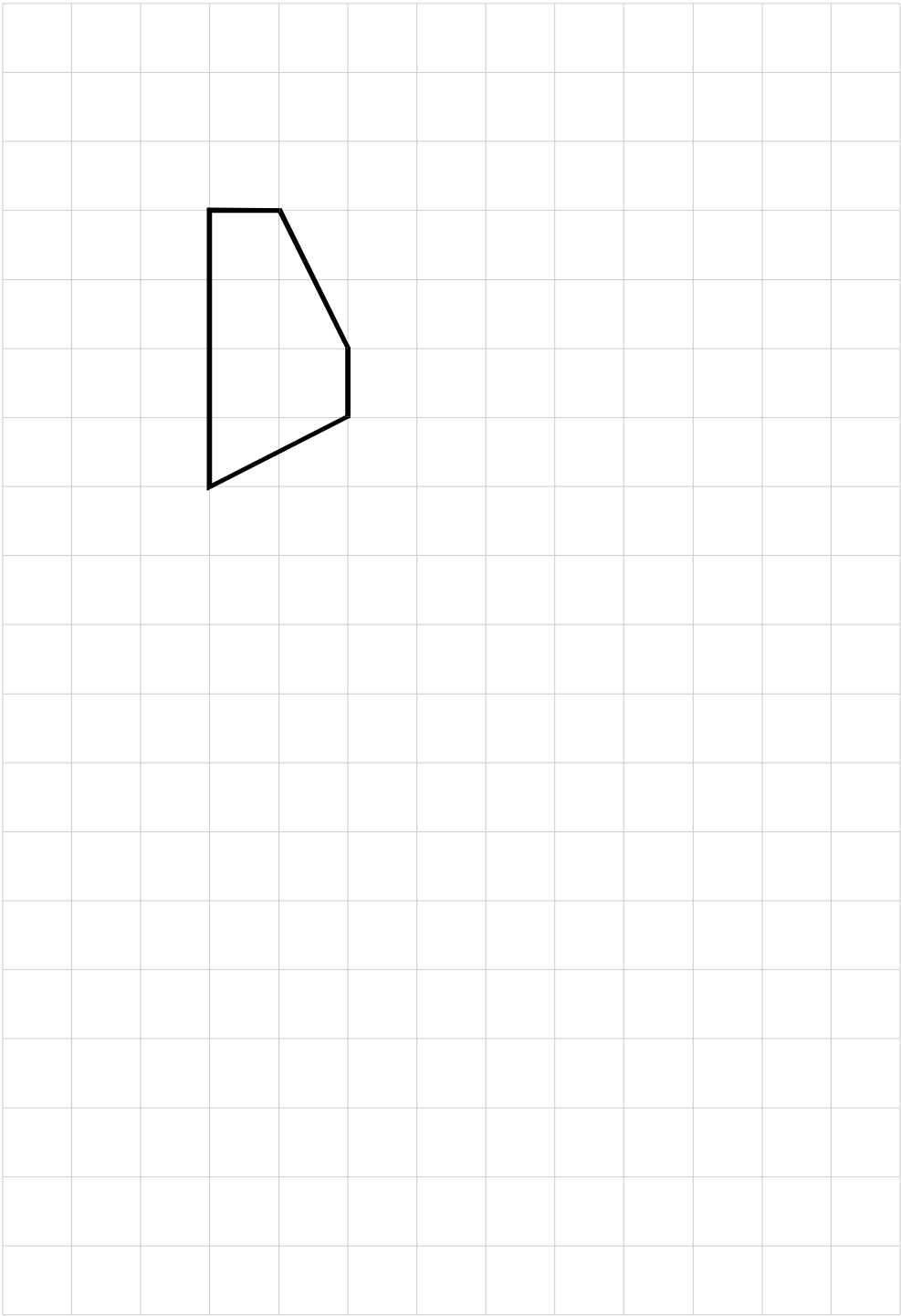
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Answer

(2)

(Total 4 marks)

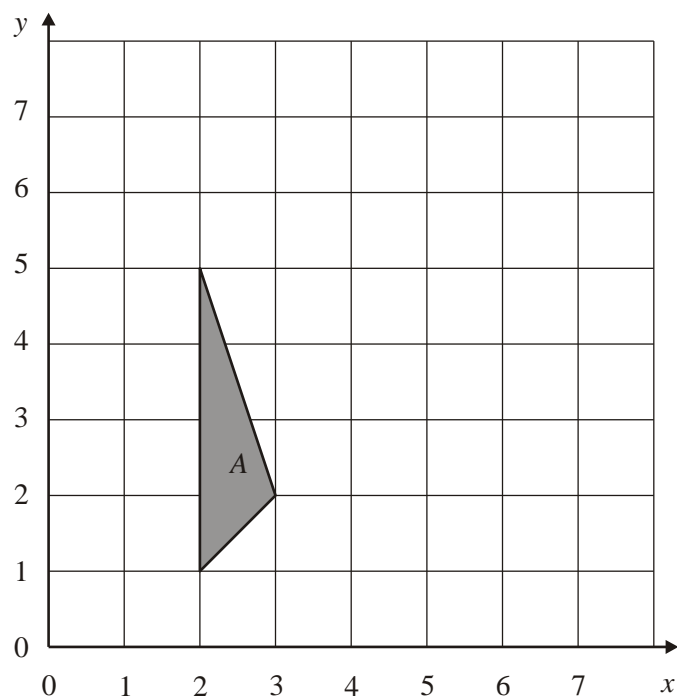
79. Enlarge the shape by a scale factor of 3.



(Total 2 marks)

80. (a) The grid shows a triangle A .

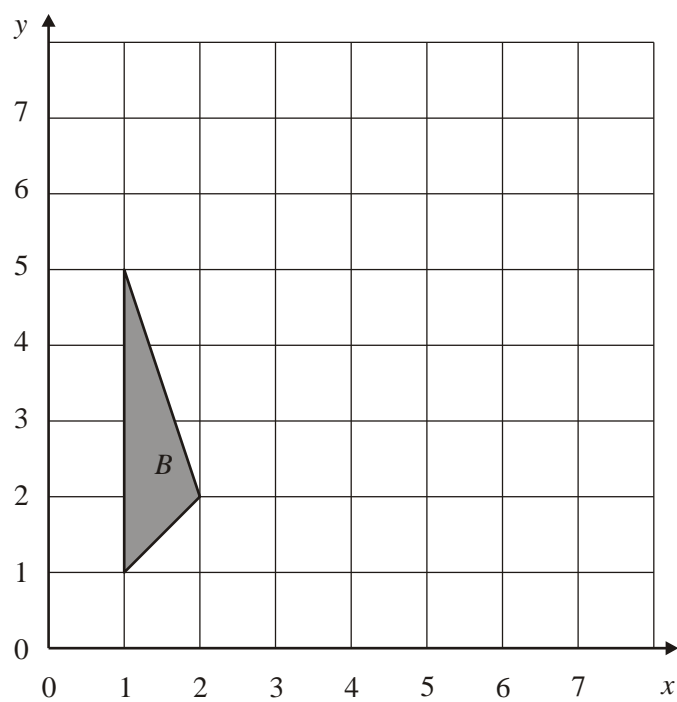
Reflect triangle A in the line $x = 3$



(2)

- (b) The grid shows a triangle B .

Translate triangle B , 3 squares to the right and 2 squares up.



(1)