Name:

Exam Style Questions

Area of a Trapezium

Corbettmaths

Equipment needed: Calculator, pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings
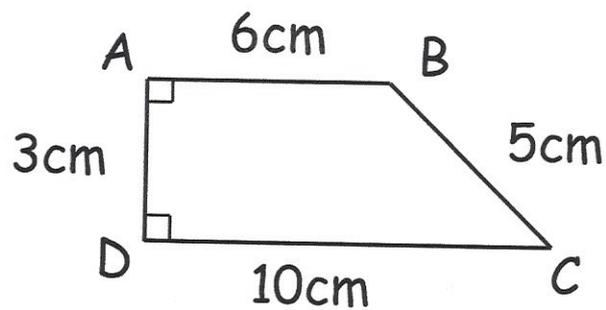
Video Tutorial

www.corbettmaths.com/contents

Video 48

Answers and Video Solutions

1. Below is a trapezium, ABCD.

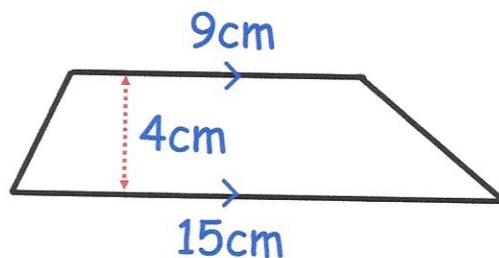
Work out the area of the trapezium.

$$\frac{1}{2}(6 + 10) \times 3$$

$$\frac{1}{2}(16) \times 3$$

$$8 \times 3 = 24$$

........24........cm²

(2)
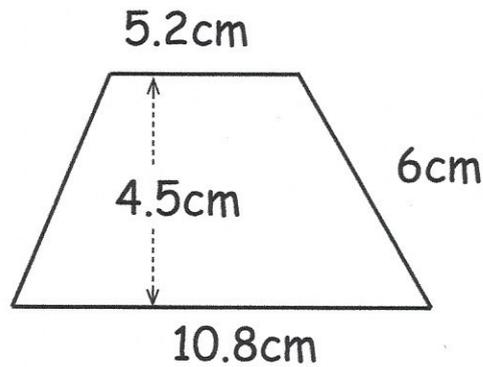
2.

Work out the area of the trapezium.

$$\frac{1}{2}(9 + 15) \times 4$$

$$\frac{1}{2}(24) \times 4$$

$$12 \times 4 = 48$$

........48........cm²
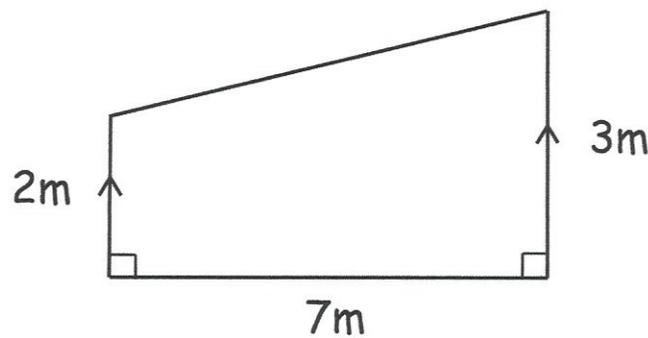
(2)

3. Shown below is a trapezium.

5.2cm

4.5cm

6cm

10.8cm

Calculate the area of the trapezium.

$$\frac{1}{2}(5.2 + 10.8) \times 4.5$$
$$\frac{1}{2}(16) \times 4.5$$
$$= 8 \times 4.5$$

.....36..... cm²

(2)

4. The diagram shows a shed wall.

2m

3m

7m

Find the area of the wall.

$$\frac{1}{2}(2+3) \times 7$$
$$\frac{1}{2}(5) \times 7$$
$$2.5 \times 7 = 17.5$$

.....17.5..... m²

(2)

5. Shown below is a trapezium.

11cm

13cm

9cm

18cm
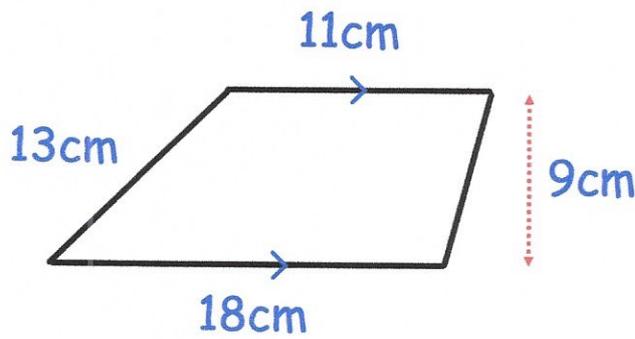
Work out the area of the trapezium.

$$\frac{1}{2}\left(11 + 18\right) \times 9$$

$$\frac{1}{2}\left(29\right) \times 9$$

$$= 130.5$$

130.5 ....cm²

(2)

6.

6cm

x

12cm
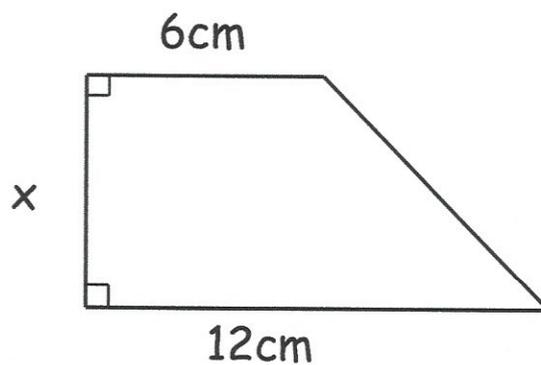
The area of the trapezium is 63cm².

Work out the value of x.

$$\frac{1}{2}\left(6 + 12\right) \times x = 63$$

$$\frac{1}{2}\left(18\right) \times x = 63$$

$$9 \times x = 63$$

$$x = 7$$

7 ....cm

(2)

7.

6cm

4cm

x
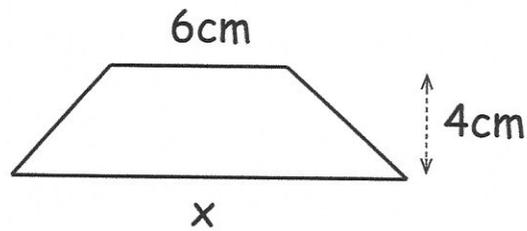
The area of the trapezium is 34cm².

Work out the value of x.
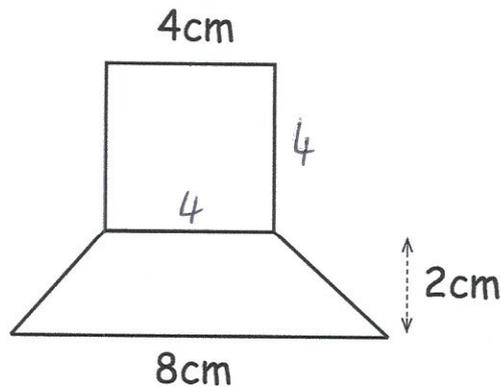
$$\frac{1}{2}(6 + x) \times 4 = 34$$

$$2(6 + x) = 34$$

$$6 + x = 17$$

$$x = 11$$

...........11...........cm

(2)

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8. A club logo is made from a square and a trapezium.

4cm

4

4

2cm

8cm

Calculate the area of the logo

Square : $4 \times 4 = 16 \, cm^2$

Trapezium : $\frac{1}{2}(4 + 8) \times 2$

$= 12 \, cm^2$

Total :

$12 + 16 = 28$

............28...........cm²

(4)

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9. Shown below is a triangle and a trapezium.
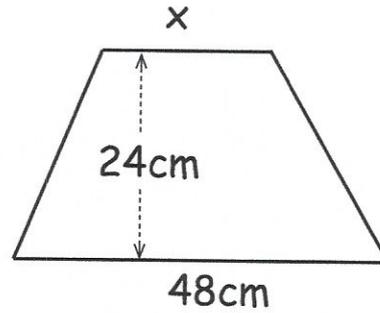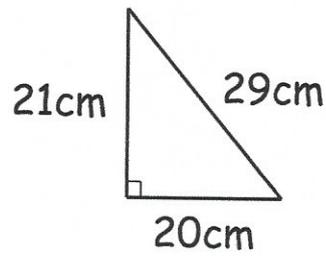
The area of the trapezium is four times the area of the triangle.

Find x.

Triangle : $\frac{1}{2} \times 20 \times 21$

$= 210 \text{ cm}^2$

$210 \times 4 = 840 \text{ cm}^2$

Trapezium : $\frac{1}{2}(x + 48) \times 24 = 840$
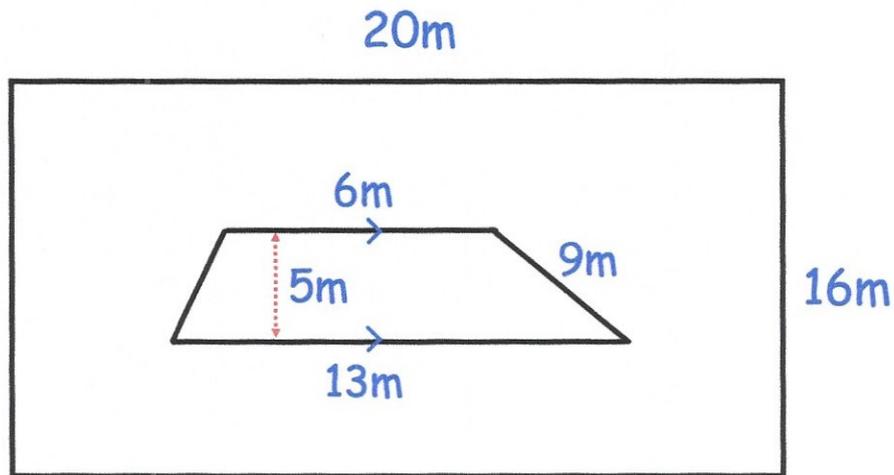
$12(x + 48) = 840$

$x + 48 = 70$

$x = 22$

...........22...........cm

(5)

10. Shown below is a rectangular garden.
    There is a flowerbed in the shape of a trapezium.

20m

Work out the percentage of the garden that the flowerbed covers.

Garden : $20 \times 16 = 320m^2$

Flower bed : $\frac{1}{2}(6+13) \times 5$

$= \frac{1}{2}(19) \times 5$

$= 47.5 m^2$

$\frac{47.5}{320} = 0.1483375$

14.84375%

.......14.84.......%

(5)

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11. Walter would like to plant a crop in the field below.

45m

25m   (A)   25

55m

(B)   30

60m
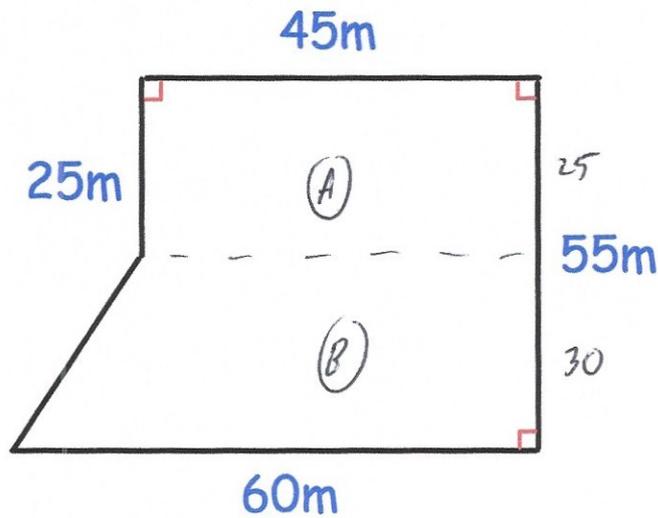
Each 8kg bag of seed costs £56
1kg of seed covers an area of 50m²

Walter has £380 to spend on the seed for the crop.
Does Walter have enough money?

Rectangle A: $25 \times 45 = 1125 m^2$

Trapezium B: $\frac{1}{2}(45+60) \times 30$

$= 1575 m^2$

$1125 + 1575 = 2700 m^2$

8kg bag covers $8 \times 50 = 400 m^2$

$2700 \div 400 = 6.75$

7 bags needed.

$7 \times 56 = £392$

No

(5)

12. Shown is a cardboard box, that is a prism.

120 cm^2 (side)

50

5cm

8cm

80

12cm front 8

10cm

3cm
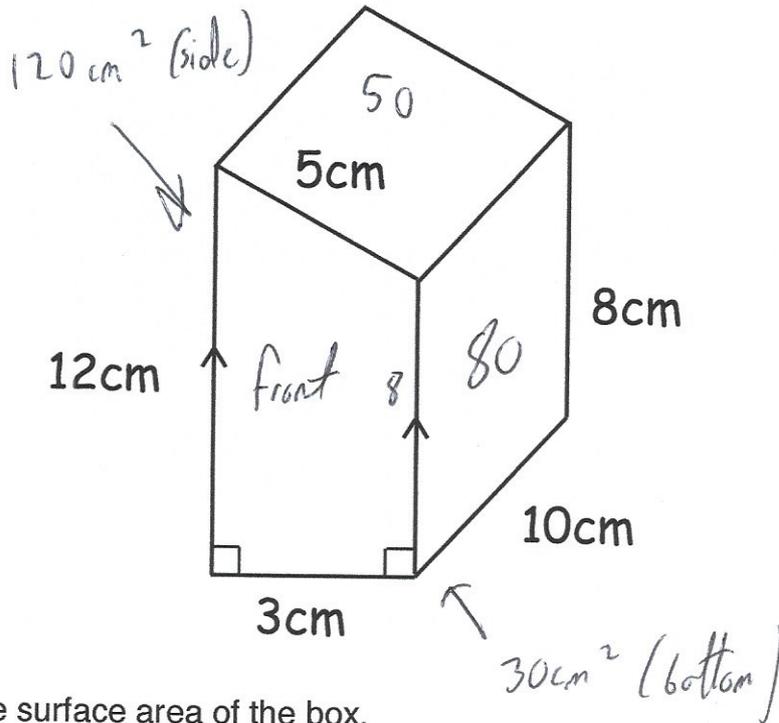
30cm^2 (bottom)

Calculate the surface area of the box.

front:

$\frac{1}{2} (8 + 12) \times 3$

$\frac{1}{2} (20) \times 3$

$= 30 \text{ cm}^2$

back $= 30 \text{cm}^2$

right $= 80 \text{cm}^2$

top : 50cm^2

bottom : 30cm^2

left : 120cm^2

$120 + 30 + 50 + 80 + 30 + 30$

$= 340 \text{cm}^2$

340

..............................cm²

(5)

13. A design is made using a semi-circle and a trapezium.

20cm

10cm Ⓑ

12cm
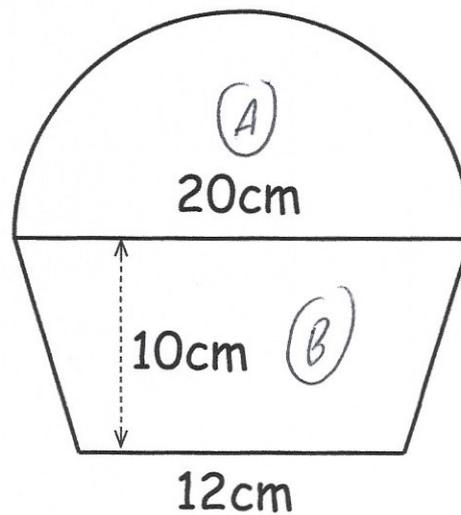
Find the area of the design.

Semicircle A : $\frac{1}{2} \times \pi \times 10^2$

$= 157.0796327 \, cm^2$ (or 50π)

Trapezium B : $\frac{1}{2} (12 + 20) \times 10$

$\frac{1}{2} (32) \times 10$

$= 160 \, cm^2$

$50\pi + 160 = 317.07963...$

..............**317.08**..............cm²

(5)

14. A garden ACDF is a trapezium.
The garden is divided in two sections, a patio, ABEF and a lawn, BCDE.

A   20m   B   C

32m   Patio   Lawn

F   47m   E 10m D
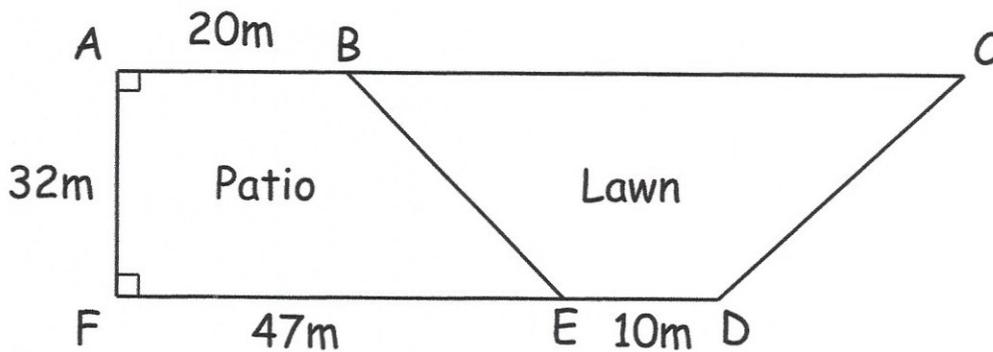
Given that the area of the patio : the area of the lawn = 4 : 5

Find the length of BC

Area of Patio $\frac{1}{2}(20+47) \times 32$

$= 1072 \, m^2$

$1072 \div 4 = 268$
$268 \times 5 = 1340 \, m^2$ (lawn)

$\frac{1}{2}(10+BC) \times 32 = 1340$

$16(10+BC) = 1340$

$10 + BC = 83.75$

$BC = 73.75$

..........73.75..........m

(6)

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15. A trapezium is drawn below.

20cm

17cm

h

h

17cm

8

36cm

8
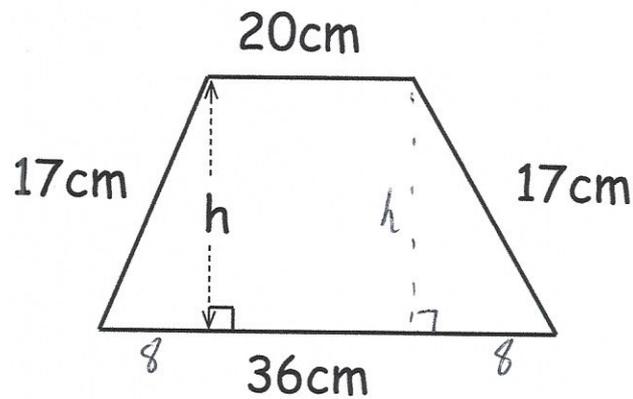
(a) Use Pythagoras' Theorem to show that h = 15cm

$$h^2 + 8^2 = 17^2$$

$$h^2 + 64 = 289$$

$$h^2 = 225$$
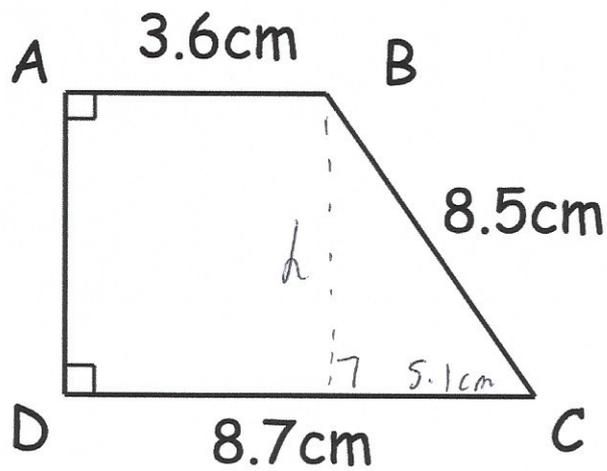
$$h = 15$$

(3)

(b) Find the area of the trapezium

$$\frac{1}{2}(20 + 36) \times 15$$

$$28 \times 15 = 420$$

420 ....cm²

(2)

16. Shown below is a trapezium.

Find the area of the trapezium.

$$h^2 + 5.1^2 = 8.5^2$$

$$h^2 + 26.01 = 72.25$$

$$h^2 = 46.24$$

$$h = 6.8$$

$$\frac{1}{2}(3.6 + 8.7) \times 6.8$$

$$= 41.82$$

..........41.82..........cm²

(5)