

Name: _____

GCSE Higher
Set B
Calculator Paper



Corbettmaths

Equipment

1. A blue or black ink ball-point pen.
2. A pencil.
3. An eraser.
4. A ruler.
5. A pair of compasses.
6. A protractor.
7. A calculator

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

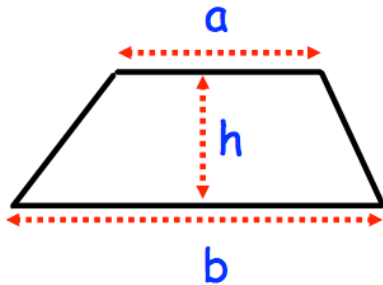
Information

1. The maximum mark for this paper is 100.
2. The marks for questions are shown in brackets
3. You may ask for more lined, graph or tracing paper.

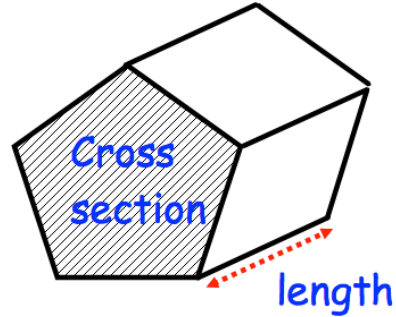
| Question | Mark | Available |
|--------------|------|------------|
| 1 | | 2 |
| 2 | | 2 |
| 3 | | 3 |
| 4 | | 3 |
| 5 | | 6 |
| 6 | | 2 |
| 7 | | 4 |
| 8 | | 4 |
| 9 | | 2 |
| 10 | | 4 |
| 11 | | 2 |
| 12 | | 5 |
| 13 | | 3 |
| 14 | | 4 |
| 15 | | 4 |
| 16 | | 6 |
| 17 | | 5 |
| 18 | | 2 |
| 19 | | 4 |
| 20 | | 3 |
| 21 | | 5 |
| 22 | | 3 |
| 23 | | 6 |
| 24 | | 8 |
| 25 | | 5 |
| 26 | | 3 |
| Total | | 100 |

Formulae: Higher Tier

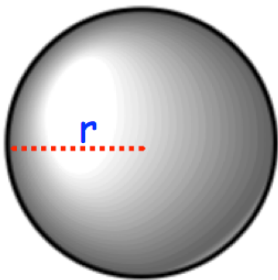
Area of a Trapezium = $\frac{1}{2}(a + b)h$



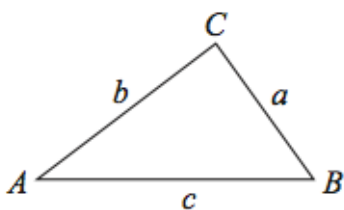
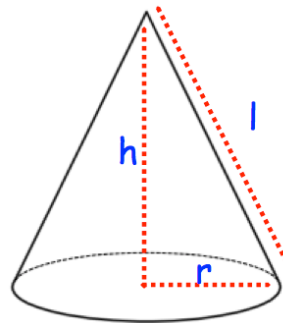
Volume of a prism = area of cross section x length



Volume of a sphere = $\frac{4}{3}\pi r^3$
 Surface area of a sphere = $4\pi r^2$



Volume of a cone = $\frac{1}{3}\pi r^2 h$
 Curved surface area of a cone = $\pi r l$



Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

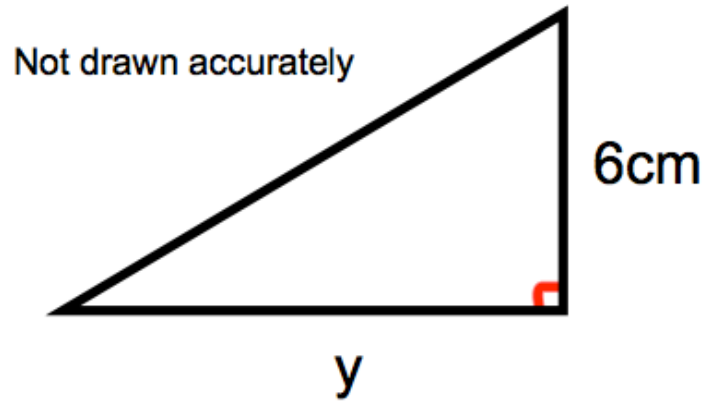
Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2} ab \sin C$

The Quadratic Equation
 The solutions of $ax^2 + bx + c = 0$
 where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

1. Shown below is a right-angled triangle.



The area of the triangle is 21cm^2
Calculate y , the length of the base.

.....cm
(2)

2. A football team can either win, draw or lose their next match.
The table shows the probabilities of a win or a draw.

| Result | Win | Draw | Lose |
|-------------|------|------|------|
| Probability | 0.61 | 0.2 | |

Work out the probability that the team will lose.

.....
(2)

3. Jo has a recipe for Bolognese Sauce,

Bolognese Sauce

| | |
|------------------|--------|
| Minced Beef | 500 g |
| Chopped Tomatoes | 750 g |
| Mushrooms | 40 g |
| Chicken Stock | 150 ml |

She only has 400g of minced beef.

How much of the other ingredients should she use?

Chopped Tomatoes:g

Mushrooms:g

Chicken Stock:ml

(3)

4. Fiona leaves £1600 in the bank for four years.
It earns compound interest of 4% each year.

Calculate the total amount Fiona has in the bank at the end of the four years.

£.....
(3)

-
5. (a) Simplify $8x + 3y - 2(3y - 5x)$

.....
(2)

- (b) Solve $10x - 3 = 25$

x =
(2)

- (c) Simplify $4y^6 \times 2y^5$

.....
(2)

6. 13 out of 20 students in a class are right handed.

What percentage of the class are right handed?

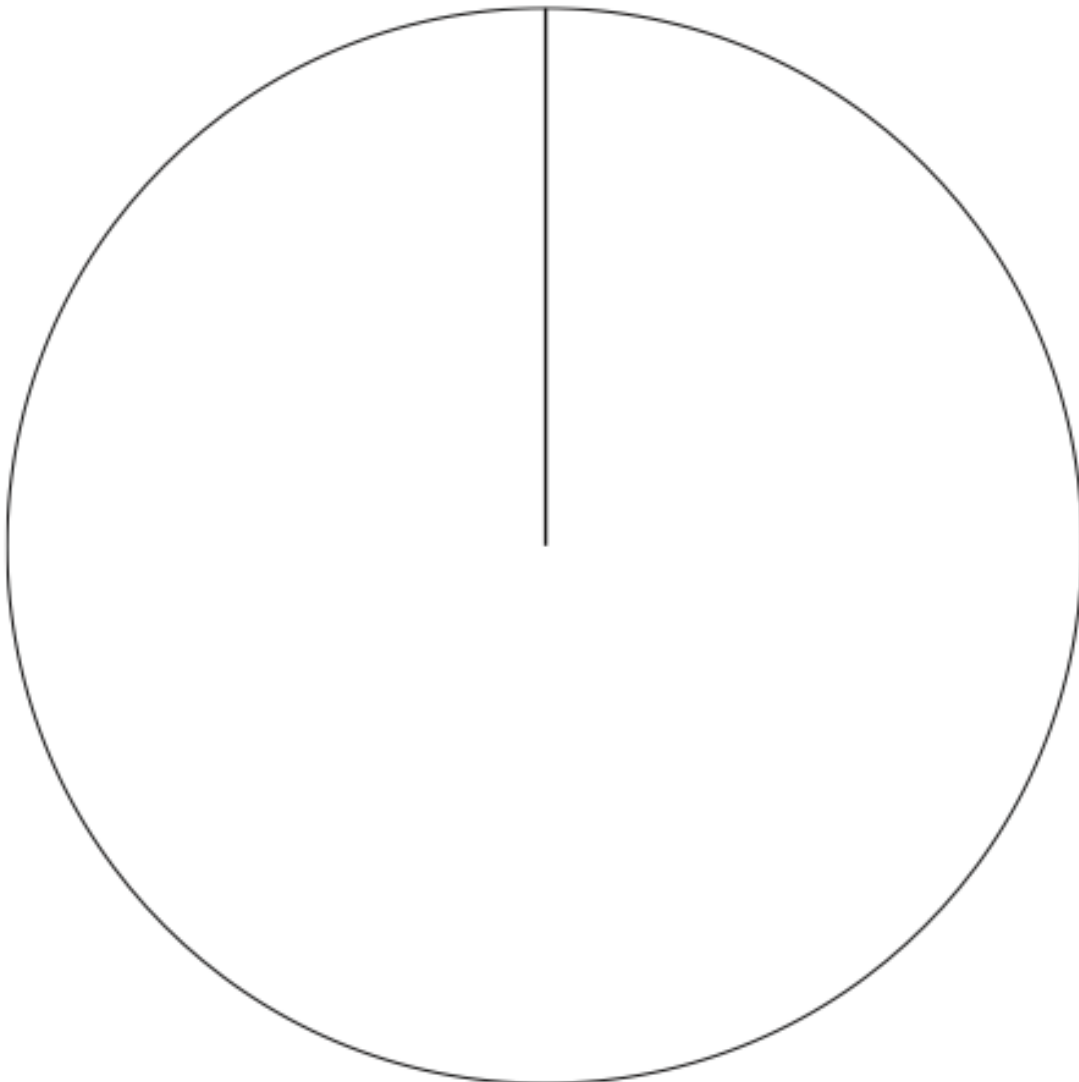
.....%

(2)

7. The table gives information about the number of students in years 7 to 10.

| Year | Frequency |
|------|-----------|
| 7 | 200 |
| 8 | 140 |
| 9 | 220 |
| 10 | 160 |

Draw an accurate pie chart to show this information.



(4)

8. Timothy asked 30 people how long it takes them to get to school.

The table shows some information about his results.

| Time (t minutes) | Frequency |
|------------------|-----------|
| $0 < t \leq 10$ | 2 |
| $10 < t \leq 20$ | 8 |
| $20 < t \leq 30$ | 12 |
| $30 < t \leq 40$ | 7 |
| $40 < t \leq 50$ | 1 |

Work out an estimate for the mean time taken.

.....minutes
(4)

9.

(a) Use your calculator to find

$$\sqrt[4]{100 - 2.4^3}$$

(a) Give all the figures in your calculator display.

.....
(1)

(b) Write your answer to 3 significant figures.

.....
(1)

10. $-5 < 2k \leq 6$
k is an integer.

(a) Write down all the possible values of k.

.....
(2)

(b) Solve the inequality

$$\frac{x + 3}{4} > 7$$

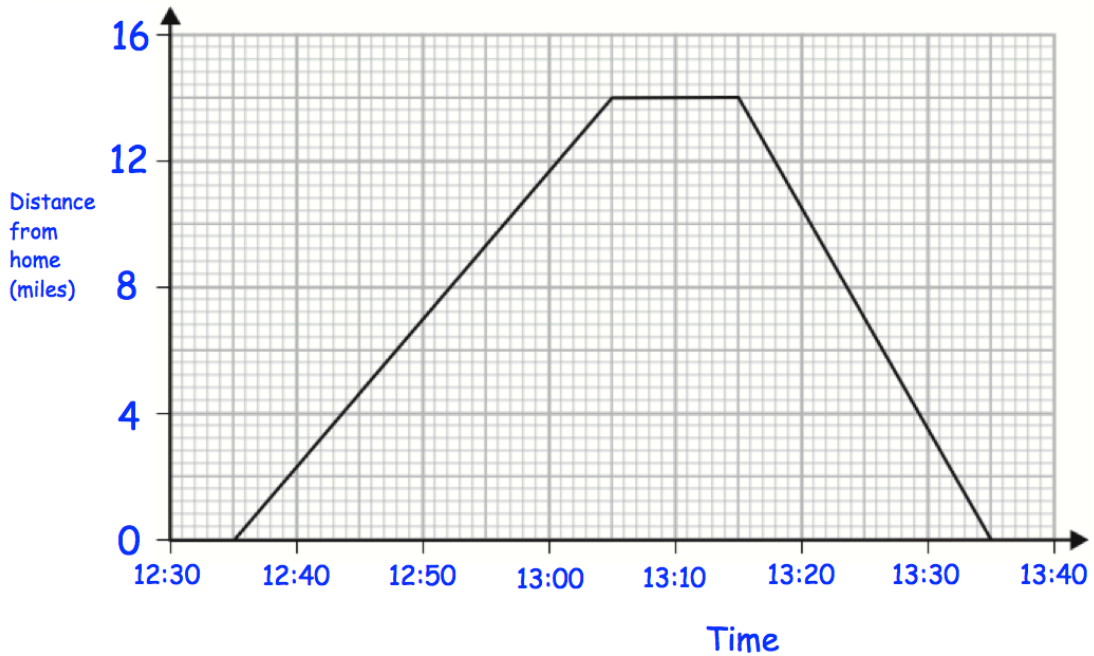
.....
(2)

-
11. Bethany wants to find out the amount of time people jog a week.
She will use a questionnaire.

Design a suitable question for Bethany to use in her questionnaire.
Include response boxes.

(2)

12. Sophie drove from her house to a train station to pick up her brother. Sophie waited for her brother. Then Sophie drove them both back home. Here is a distance-time graph for Sophie's journey.



(a) At what time did Sophie arrive at the train station?

.....
(1)

(b) How long did Sophie wait at the train station?

.....
(1)

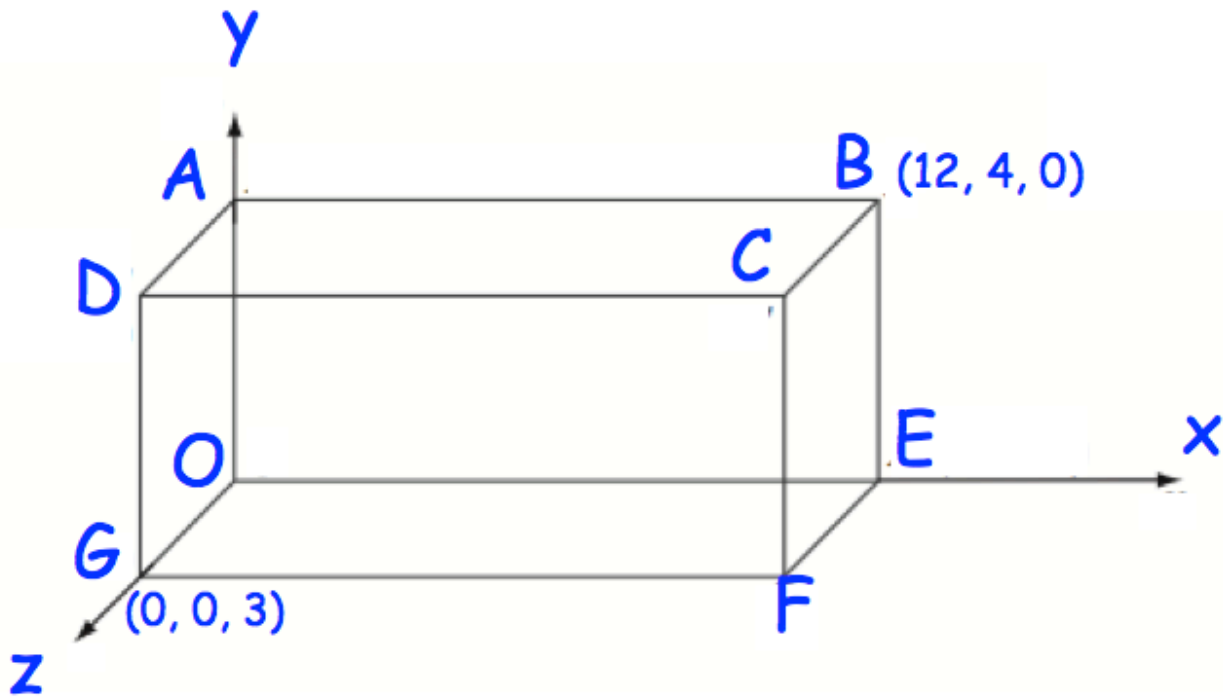
(c) Work out the distance travelled in total by Sophie.

.....miles
(1)

(d) Work out Sophie's average speed on her journey home.

.....miles per hour
(2)

13. The diagram shows a cuboid on a 3D grid.



(a) Write down the coordinates of the point C.

(..... , ,)
(1)

(b) Write down the coordinates of the point F.

(..... , ,)
(1)

(c) Write down the coordinates of the midpoint of the line segment BG.

(..... , ,)
(1)

14. (a) Write 391000000 in standard form.

.....
(1)

(b) Write 125×10^5 in standard form.

.....
(1)

(c) Work out $(8.2 \times 10^5) \div (5.1 \times 10^9)$
Give your answer in standard form.

.....
(2)

15. The equation

$$(x + 1)(x + 3) = 84$$

has a solution between 7 and 8.

Use trial and improvement to find this solution.

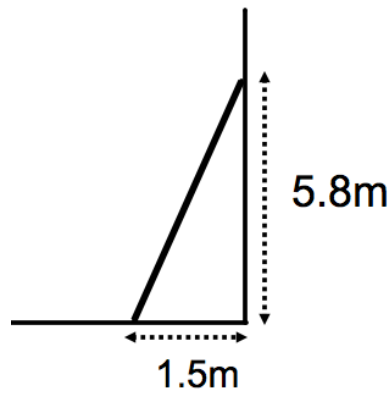
Give your answer correct to 1 decimal place.

You must show all your working.

$x = \dots\dots\dots$

(4)

16. A ladder is placed against a wall.
To be safe, it must be inclined at between 70° and 80° to the ground.



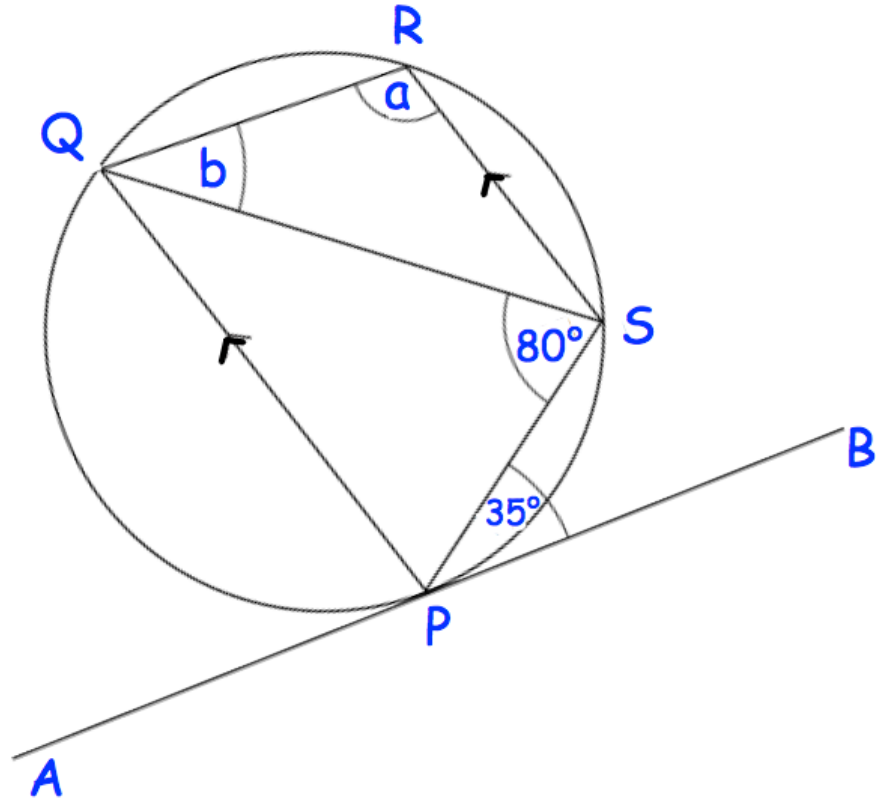
- (a) Is the ladder safe?

.....
(3)

- (b) Calculate the length of the ladder.

.....m
(3)

17. PQRS is a cyclic quadrilateral.
 APB is a tangent to the circle at P.
 PQ is parallel to SR.
 Angle SPB = 35° and angle PSQ = 80°



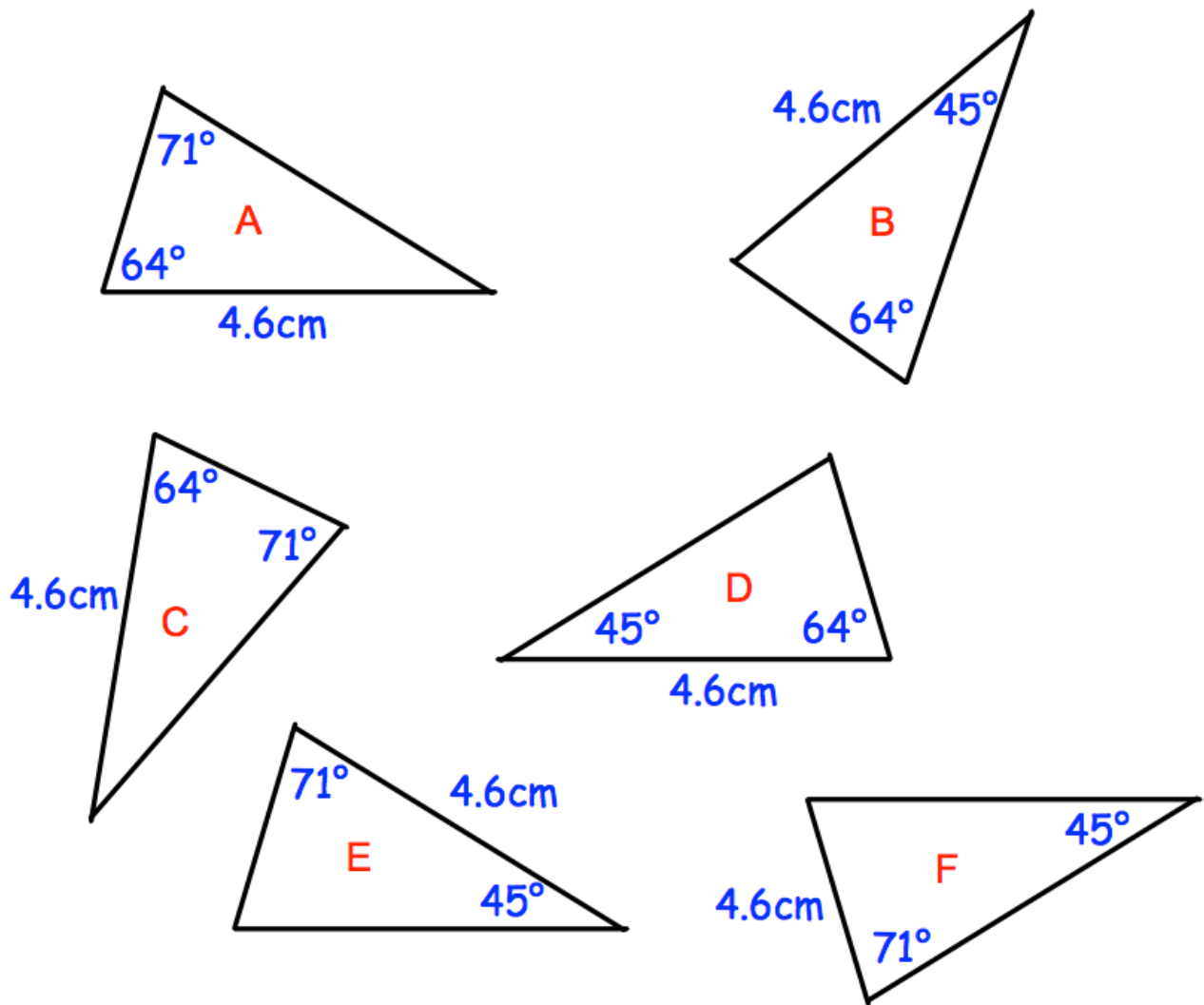
(a) Work out the size of angle QRS.

.....^o
 (3)

(b) Work out the size of angle RQS.

.....^o
 (2)

18. Shown below are six triangles that are not drawn accurately.



Which two triangles are congruent to triangle A?

..... and
(2)

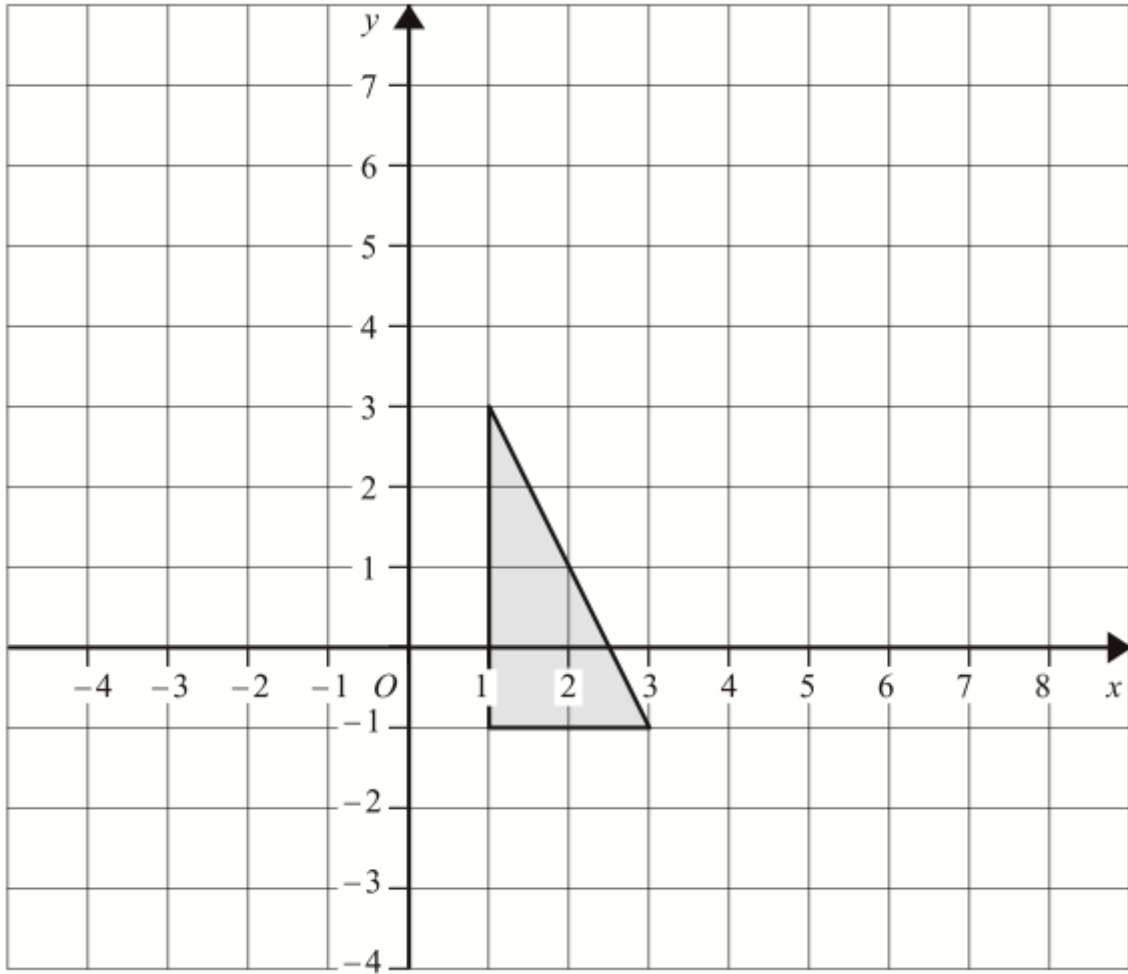
19. Jayne has a box that contains red and blue counters.
7 of the counters are red and 3 of the counters are blue.

Jayne chooses a counter at random, replaces it and chooses another at random.

Work out the probability that both counters chosen at the **same** colour.

.....
(4)

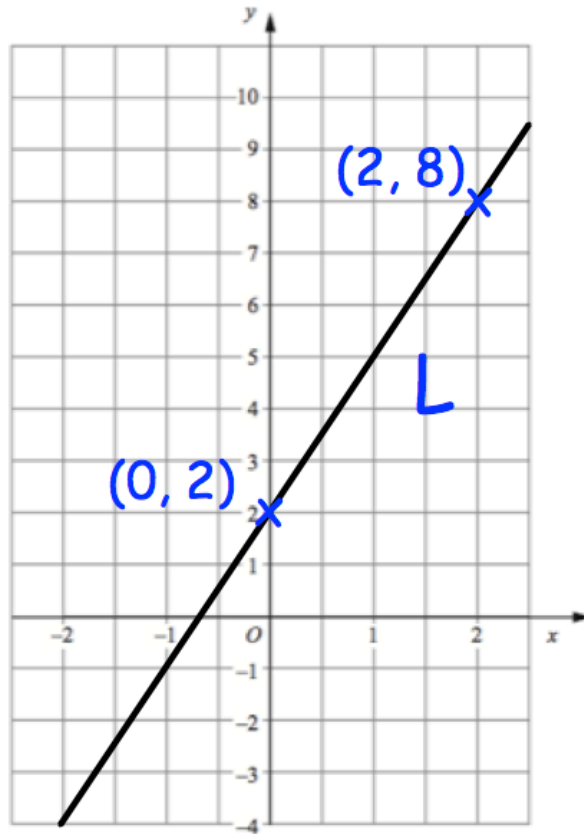
20.



Enlarge the triangle by a scale factor -2 , centre $(3, 1)$.

(3)

21.



The line L passes through the points (0, 2) and (2, 8).

(a) Find the equation of the line L.

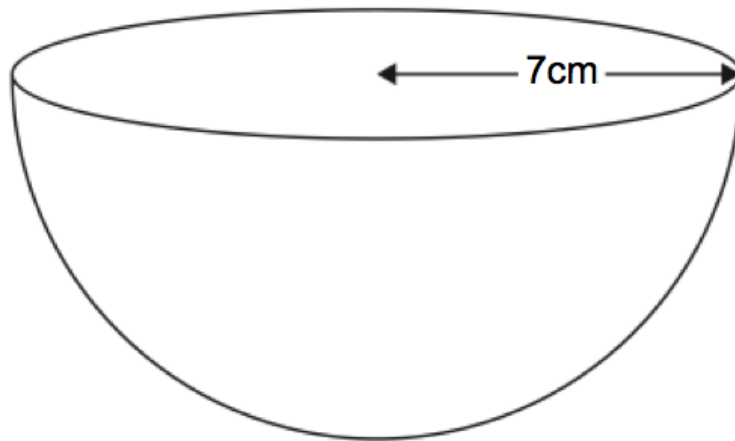
.....
(2)

A line M is perpendicular to the line L and passes through the point (0, 6).

(b) Find the equation of the line M.

.....
(3)

22. Shown below is a hemisphere.



Calculate the volume of the hemisphere.

.....cm³
(3)

23. The time taken, t , for passengers to be checked-in for a flight is inversely proportional to the square of the number of staff, s , working.

It takes 30 minutes passengers to be checked-in when 10 staff are working.

(a) Find an equation connecting t and s .

.....
(3)

(b) What is the minimum number of staff that must be working so that the time taken is under 60 minutes?

.....
(3)

24. (a) Expand and simplify $(2w + 3y)(3w - 5y)$

.....
(2)

(b) Simplify fully.

$$\frac{v + 3}{15} \div \frac{v^2 + 3v}{25}$$

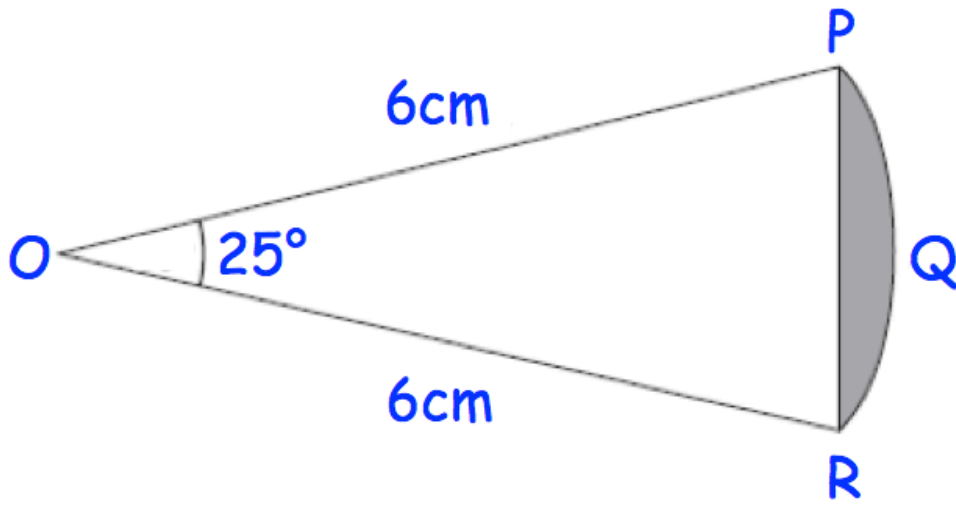
.....
(3)

(c) $x^2 - 6x - 3 \equiv (x - a)^2 - b$, where a and b are constants

Find the values of a and b.

a = and b =
(3)

25.



PQR is an arc of a circle centre O with radius 6cm.
PR is a chord of the circle.
Angle POR = 25°.

Calculate the area of the shaded region.
Give your answer to 4 significant figures.

.....cm²
(5)

26. Solve the equation $x^2 + 8x - 40 = 0$
Give your answers correct to 3 significant figures.

x = or x =
(3)