

GCSE QUESTIONS

Q1. NON-CALCULATOR

Solve $x^2 - 6x - 8 = 0$

Write your answer in the form $a \pm \sqrt{b}$ where a and b are integers.

.....
(Total for question = 3 marks)

Q2. NON-CALCULATOR

Solve $x^2 > 3x + 4$

.....
(Total for question = 3 marks)

Q3. NON-CALCULATOR

Solve the inequality $x^2 > 3(x + 6)$

.....
(Total for question = 4 marks)

Q4. NON-CALCULATOR

Solve algebraically the simultaneous equations

$$x^2 + y^2 = 25$$

$$y - 3x = 13$$

.....
(Total for question = 5 marks)

Q5. NON-CALCULATOR

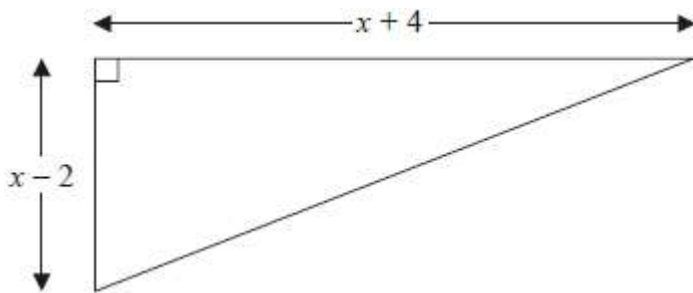
Solve algebraically

$$x^2 + y^2 = 18$$

$$x - 2y = -3$$

(Total for question = 5 marks)

Q6. NON-CALCULATOR



The diagram shows a right-angled triangle.

All the measurements are in centimetres.

The area of the triangle is 27.5 cm^2

Work out the length of the shortest side of the triangle. You must show all your working.

..... cm

(Total for question = 4 marks)

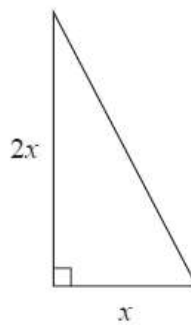
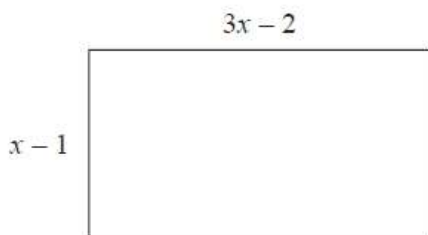
Q7. NON-CALCULATOR

n is an integer such that $3n + 2 \leq 14$ and $\frac{6n}{n^2 + 5} > 1$

Find all the possible values of n .

Q8. NON-CALCULATOR

Here is a rectangle and a right-angled triangle.



All measurements are in centimetres.
The area of the rectangle is greater than the area of the triangle.

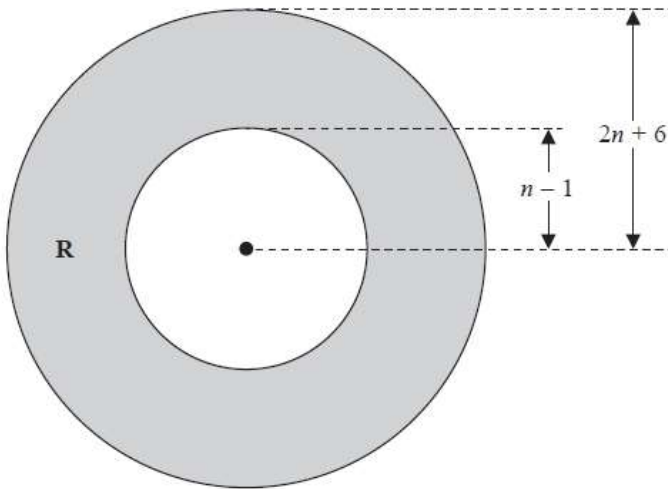
Find the set of possible values of x .

.....
(Total for question = 5 marks)

.....
(Total for question = 5 marks)

Q9. NON-CALCULATOR

The region **R**, shown shaded in the diagram, is the region between two circles with the same centre.



The outer circle has radius $(2n + 6)$
The inner circle has radius $(n - 1)$
All measurements are in centimetres.

The area of **R** is greater than the area of a circle of radius $(n + 13)$ cm.

n is an integer.

Find the least possible value of n .
You must show all of your working.

.....
(Total for question = 5 marks)

Q10. NON-CALCULATOR

The length of a rectangle is the same as the length of each side of a square.

The length of the rectangle is 4 cm more than 3 times the width of the rectangle.

The area of the square is 66 cm^2 more than the area of the rectangle.

Find the length and the width of the rectangle. You must show all your working.

.....

(Total for question = 6 marks)

Q11. CALCULATOR ALLOWED

Solve $x^2 - 5x + 3 = 0$

Give your solutions correct to 3 significant figures.

.....
(Total for question = 3 marks)

Q12. CALCULATOR ALLOWED

Solve $x^2 + 5x - 24 = 0$

.....
(Total for question = 3 marks)

Q13. CALCULATOR ALLOWED

Solve $(x - 2)^2 = 3$

Give your solutions correct to 3 significant figures.

.....
(Total for question = 2 marks)

Q14. CALCULATOR ALLOWED

$$(1 - x)^2 < \frac{9}{25}$$

Solve

.....
(Total for question = 3 marks)

Q15. CALCULATOR ALLOWED

Solve $2x^2 + 3x - 2 > 0$

.....
(Total for question = 3 marks)

Q16. CALCULATOR ALLOWED

Solve $2x^2 - 5x - 12 > 0$

.....
(Total for question = 3 marks)

Q17. CALCULATOR ALLOWED

Solve $5x^2 - 4x - 3 = 0$

Give your solutions correct to 3 significant figures.

.....
(Total for question = 3 marks)

Q18. CALCULATOR ALLOWED

Solve algebraically the simultaneous equations

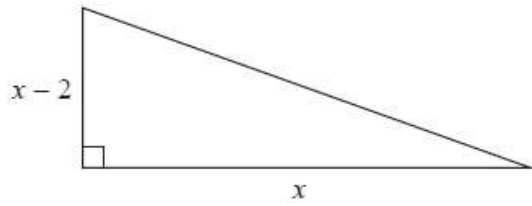
$$x^2 - 4y^2 = 9$$

$$3x + 4y = 7$$

.....
(Total for question = 5 marks)

Q19. CALCULATOR ALLOWED

Here is a right-angled triangle.



All measurements are in centimetres.

The area of the triangle is 2.5 cm^2 .

Find the perimeter of the triangle.

Give your answer correct to 3 significant figures.

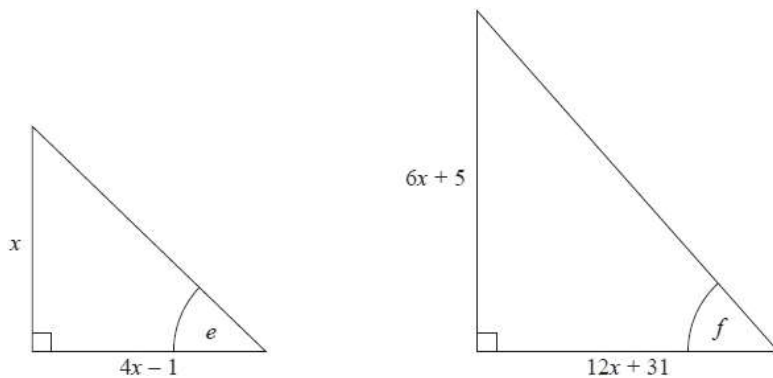
You must show all of your working.

..... cm

(Total for question is 6 marks)

Q20. CALCULATOR ALLOWED

Here are two right-angled triangles.



Given that

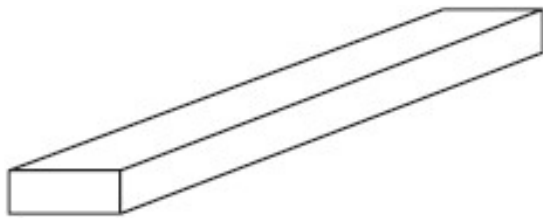
$$\tan e = \tan f$$

find the value of x .

You must show all your working.

.....
(Total for question = 5 marks)

Q21. CALCULATOR ALLOWED



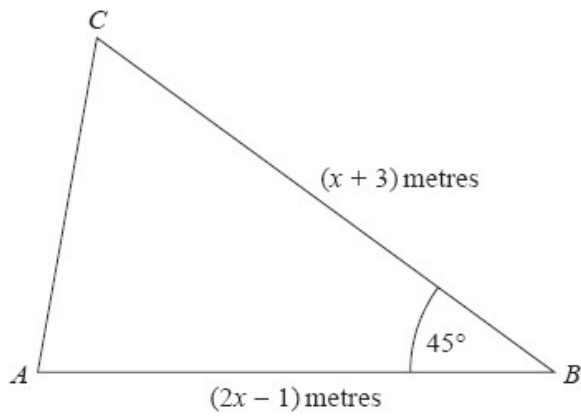
A solid cuboid has a volume of 40 cm^3
The cuboid has a total surface area of 100 cm^2
One edge of the cuboid has length 2 cm .

Find the length of a diagonal of the cuboid.
Give your answer correct to 3 significant figures.

..... cm

(Total for question = 6 marks)

Q22. CALCULATOR ALLOWED



The area of triangle ABC is $6\sqrt{2} \text{ m}^2$.

Calculate the value of x .
Give your answer correct to 3 significant figures.

.....
(Total for question = 5 marks)

Q23. CALCULATOR ALLOWED

There are y black socks and 5 white socks in a drawer.

Joshua takes at random two socks from the drawer.

The probability that Joshua takes one white sock and one black sock is $\frac{6}{11}$

(a) Show that $3y^2 - 28y + 60 = 0$

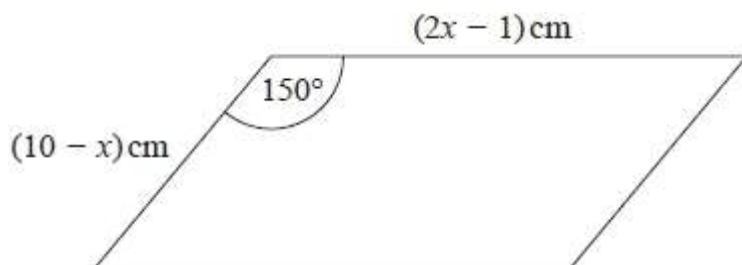
(4)

(b) Find the probability that Joshua takes two black socks.

.....
(3)
(Total for question = 7 marks)

Q24. CALCULATOR ALLOWED

The diagram shows a parallelogram.



The area of the parallelogram is greater than 15 cm^2

(a) Show that $2x^2 - 21x + 40 < 0$

(3)

(b) Find the range of possible values of x .

.....

(3)

(Total for question = 6 marks)

Q25. CALCULATOR ALLOWED

$$f(x) = \frac{1}{x+2} + \frac{1}{x-3}$$

(a) Work out $f(5)$

Give your answer as a fraction.

.....

(2)

(b) Write down a value of x for which $f(x)$ is not defined.

.....

(1)

Given that $f(x) = 4$

(c) find the possible values of x .

Give your answer in the form $\frac{p \pm \sqrt{q}}{r}$ where p , q and r are positive integers.

.....
(5)
(Total for question = 8 marks)

Q26. CALCULATOR ALLOWED

Write $x^2 + 6x - 7$ in the form $(x + a)^2 + b$ where a and b are integers.

.....
(Total for question = 2 marks)

Q27. CALCULATOR ALLOWED

$(x - 8)(x + 4) = (x - a)^2 + b$ for all values of x .

Find the value of a and the value of b .

$a = \dots\dots\dots$

$b = \dots\dots\dots$

(Total for question = 3 marks)