



EXAM PAPERS PRACTICE

GCSE Edexcel Math 1MA1 Inequalities

Answers

*"We will help you to
achieve A Star "*



Answer 1

- (a) n is an integer. "WHOLE NUMBER"
 $-1 \leq n < 4$

List the possible values of n .

-1, 0, 1, 2, 3



Answer 2

(c) Solve $y - 2 > 5$

$+2$ $+2$

$y > 7$



Answer 3

(b) Solve the inequality $8x - 3 \geq 6x + 4$

(DO AS IF AN EQUATION)

$$8x - 3 \geq 6x + 4$$

$-6x$ $-6x$

$$2x - 3 \geq 4$$

$+3$ $+3$

$$\frac{2x}{2} \geq \frac{7}{2}$$

$$\underline{\underline{x \geq 3.5}}$$



Answer 4

(b) Solve the inequality

$$3p - 7 > 11$$

Just like solving
an equation

$$3p - 7 > 11$$

+7 +7

$$\frac{3p}{3} > \frac{18}{3}$$

$$\underline{\underline{p > 6}}$$



Answer 5

(b) Solve $6(x-2) > 15$

"GROF GROB LET FIND ANSWER"

GROB

$$6x - 12 > 15$$

+12 +12

LET

$$\frac{6x}{6} > \frac{27}{6}$$

D

$$x > 4.5$$

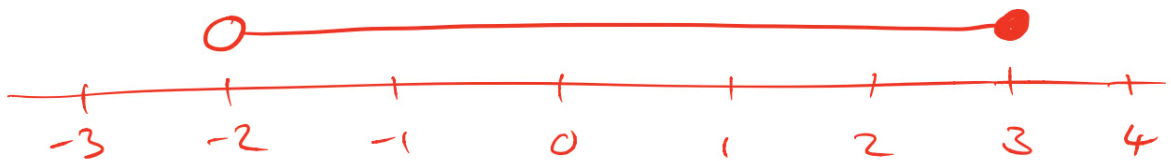


Answer 6

m is an integer such that $-2 < m \leq 3$

→ WHOLE NUMBER

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



-1, 0, 1, 2, 3



Answer 7

GREATER THAN

(a) Solve the inequality $6y + 5 > 8$

$$-5 \quad -5$$

$$\frac{6y}{6} > \frac{3}{6}$$

$$\underline{\underline{y > \frac{1}{2}}}$$



Answer 8

IS GREATER THAN

Solve $6x + 4 > x + 17$
 $\rightarrow x \quad \rightarrow x$

$$5x + 4 > 17$$

$-4 \quad -4$

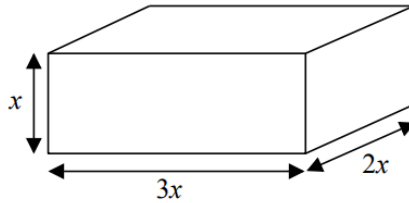
$$\frac{5x}{5} > \frac{13}{5}$$

$$\underline{\underline{x > \frac{13}{5}}} \quad \text{OR} \quad \underline{\underline{x > 2.6}}$$



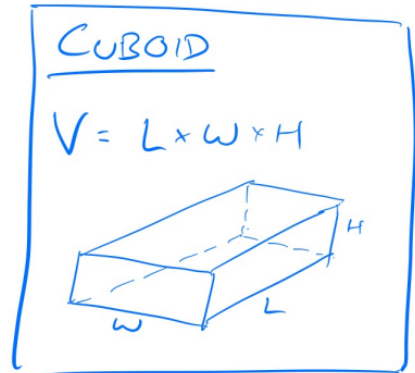
Answer 9

Here is a cuboid.



All measurements are in centimetres.
 x is an integer. \rightarrow WHOLE NUMBER
The total volume of the cuboid is less than 900 cm^3

Show that $x \leq 5$



\rightarrow VOLUME < 900

$$3x \times 2x \times x < 900$$

$$\frac{6x^3}{6} < \frac{900}{6}$$

$$x^3 < \frac{3 \times 300}{3 \times 2} \quad 150$$

$$x^3 < 150$$

x IS BETWEEN 5 AND 6

SO x , BEING AN INTEGER

CAN BE AT MOST 5

$$\underline{\underline{x \leq 5}}$$

CUBES

$$2^3 = 8$$

$$3^3 = 27$$

$$4^3 = 64$$

$$5^3 = 125$$

$$6^3 = 216$$



Answer 10

(b) Solve $7x - 9 < 3x + 4$

$$\begin{array}{r} 7x - 9 < 3x + 4 \\ -3x \quad \quad -3x \end{array}$$

$$\begin{array}{r} 4x - 9 < 4 \\ \quad +9 \quad \quad +9 \end{array}$$

$$\frac{4x}{4} < \frac{13}{4}$$

$$x < \frac{13}{4}$$

$$\text{or } \underline{\underline{x < 3.25}}$$

$$\underline{\underline{x < 3.25}}$$



Answer 11

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

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

SIGNS ARE DIFFERENT
→ BIGGER NUMBER POSITIVE

$$\frac{-4}{4x-1}$$

CHEAT:

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

UNCHEAT BY CANCELLING

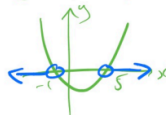
$$(x+2)(2x-1) > 0$$

Roots $x = -2$, $x = \frac{1}{2}$

$$\underline{\underline{x < -2}}, \quad \underline{\underline{x > \frac{1}{2}}}$$

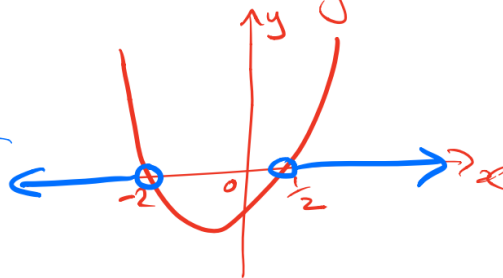
QUADRATIC INEQUALITIES

- ALWAYS
- FACTORISE
 - SKETCH A GRAPH
 - USE x-AXIS AS A NUMBER LINE



$$\rightarrow \underline{\underline{x < -1}} \text{ or } \underline{\underline{x > 5}}$$

SKETCH OF $y = (x+2)(2x-1)$





Answer 12

"WHOLE NUMBER"

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

Find all the possible values of n .

$$3n + 2 \leq 14$$

-2 -2

$$\frac{3n}{3} \leq \frac{12}{3}$$

$$\underline{n \leq 4}$$

QUADRATIC INEQUALITIES

- ALWAYS
- FACTORISE
 - SKETCH A GRAPH
 - USE x -AXIS AS A NUMBER LINE
- eg $x^2 - 4x - 5 > 0$
 $(x+1)(x-5) > 0$
-
- $\rightarrow \underline{x < -1}$ or $\underline{x > 5}$

$$\frac{\cancel{n^2 + 5} \times 6n}{\cancel{n^2 + 5}} > 1 \times (n^2 + 5)$$

$$6n > n^2 + 5$$

-6n -6n

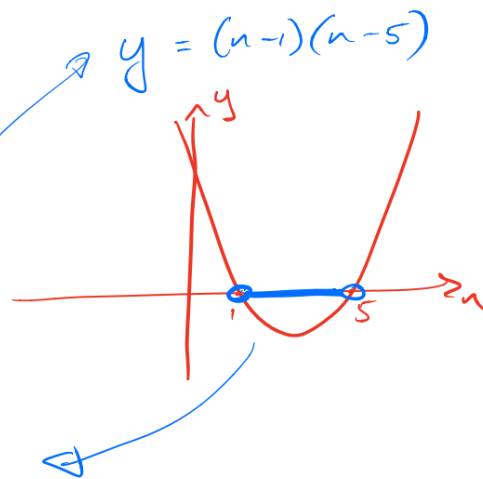
$$0 > n^2 - 6n + 5$$

$$0 > (n-1)(n-5)$$

CRITICAL VALUES $n=1, n=5$

$$1 < n < 5$$

n CAN BE 2, 3, 4





Answer 13

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

$$x^2 > 3x + 18$$

$-3x \quad -18 \quad -3x \quad -18$

$$x^2 - 3x - 18 > 0$$

Signs are different
Bigger number will be negative

$$(x+3)(x-6) > 0$$

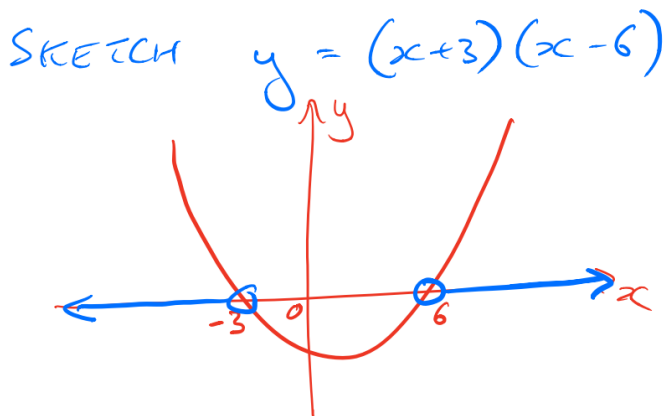
$x = -3 \quad x = 6$

QUADRATIC INEQUALITIES

ALWAYS • FACTORISE
eg $x^2 - 4x - 5 > 0$
 $(x+1)(x-5) > 0$ • SKETCH A GRAPH
• USE x-AXIS AS A NUMBER LINE

$\rightarrow \underline{x < -1}$ or $\underline{x > 5}$

$$\frac{-18}{-18 \times 1}$$
$$-9 \times 2$$
$$\underline{-6 \times 3}$$



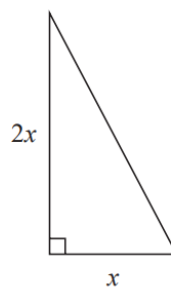
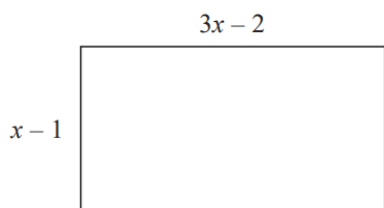
WE WANT x VALUES FOR WHICH $y > 0$

So $\underline{x < -3}$ or $\underline{x > 6}$



Answer 14

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 .

AREA OF TRIANGLE

$$A = \frac{1}{2}bh$$

AREA OF $\square >$ AREA OF Δ

$$(x-1)(3x-2) > \frac{1}{2} \times 2x \times 2x$$

F O I L

$$3x^2 - 2x - 3x + 2 > x^2$$
$$3x^2 - 5x + 2 > x^2$$
$$-x^2 \qquad -x^2$$

$$2x^2 - 5x + 2 > 0$$

$$(2x-1)(x-2) > 0$$

Roots: $x = \frac{1}{2}$ $x = 2$

$$x < \frac{1}{2} \text{ OR } x > 2$$

BUT, SINCE $x-1$, IS A LENGTH

$x > 1$ SO WE IGNORE $x < \frac{1}{2}$

So $x > 2$

QUADRATIC INEQUALITIES

ALWAYS • FACTORISE

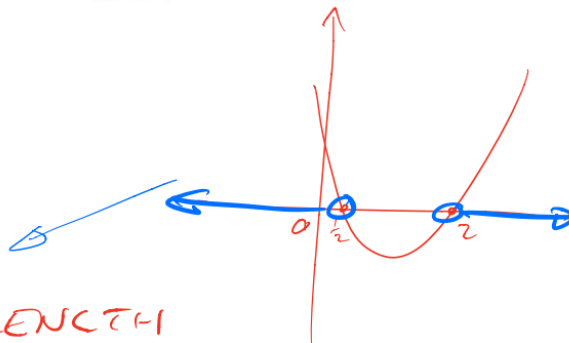
eg $x^2 - 4x - 5 > 0$

$(x+1)(x-5) > 0$

• SKETCH A GRAPH

• USE x -AXIS AS A NUMBER LINE

$\rightarrow x < -1 \text{ OR } x > 5$





Answer 15

Solve $x^2 > 3x + 4$

TREAT LIKE A QUADRATIC

EQUATION:

$$\begin{array}{r} x^2 > 3x + 4 \\ -3x - 4 \quad -3x - 4 \\ \hline \end{array}$$

$$x^2 - 3x - 4 > 0$$

$$(x + 1)(x - 4) > 0$$

$$\underline{x < -1} \quad \text{OR} \quad \underline{x > 4}$$

SKETCH $y = (x + 1)(x - 4)$

