



Topics: Quadratic and Fractional Equation, and Simultaneous Equations

1 Sketch the graph of y = -(x + 5)(x - 4) on the axes below. Indicate clearly the points where the graph crosses the axes and include the coordinates of the turning point.



[3]

- 2 The expression $x^2 10x + q$ is equivalent to $(x + r)^2 32$.
 - (a) Find the value of r and the value of q.

Answer r =[3] q =

(b) The curve $y = x^2 - 10x + q$ is drawn. Write down the equation of the line of symmetry of the curve.

Answer [1]

3 (a) Solve the equation
$$\frac{1}{2x^2-2} - \frac{3}{1-x} = 2$$
.

Answer

Answer x = or [4]

(b) Hence, find the number of solutions to the equation $\frac{1}{2a^4-2} - \frac{3}{1-a^2} = 2$. Explain your answer clearly with working. *Answer*

[3]

4 The graph $y = x^2 + x - 2$ is drawn on the grid.



Using the graph, solve,

(a) $x^2 + x - 2 = 0$.

Answer
$$x =$$
 or [1]

(b)
$$x^2 - 5x - 2 = 0$$
.

Answer x = or [2]

5 (a) Solve the inequalities $-\frac{x}{2} \le \frac{2-3x}{5} < \frac{17+x}{3}$ and represent the solution on a number line.

Answer

Answer

[4]

(b) Hence, find the greatest possible value of x^2 .

Answer

Answer [1]

- 6 Rachel and Monica went on a cycling trip of 50 km together. Rachel took x minutes to complete the trip. Monica took 10 minutes more than Rachel to complete the trip.
 - (a) Write down an expression, in terms of x, for Rachel's average speed in km/h for the trip.

Answer km/h [1]

(b) Write down an expression, in terms of x, for Monica's average speed in km/h for the trip.

Answer km/h [1]

(c) On average, Rachel was 12 km/h faster than Monica. Write down an equation in x to represent this information and show that it reduces to

$$x^2 + 10x - 2500 = 0.$$

Answer

(d) Solve the equation $x^2 + 10x - 2500 = 0$.

Answer x = or [2]

(e) Explain why one of the solutions in part (d) must be rejected.Answer

[1]

END OF TEST