

GCSE Maths: Recognising graphs from their equations (Higher): worksheet

GCSE Maths - Quadratic and Other Graphs - Higher - Lesson 13.5

Name: _____

Date: _____

Score: _____

14 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch13-quadratic-other-graphs/higher/recognising-graphs-from-their-equations/

Exercise 13E Recognising and sketching graphs Non-calculator

1 Name the type of graph given by each equation (linear, quadratic, cubic or reciprocal) and describe its shape.

(a) $y = 3x - 2$

Answer: _____

(b) $y = x^2 + 4$

Answer: _____

(c) $y = x^3 - 1$

Answer: _____

(d) $y = \frac{5}{x}$

Answer: _____

(e) $y = -2x^2$

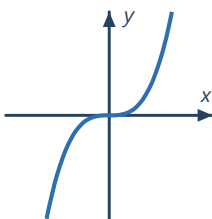
Answer: _____

(f) $y = -\frac{3}{x}$

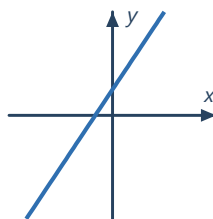
Answer: _____

2 Match each equation to its graph.

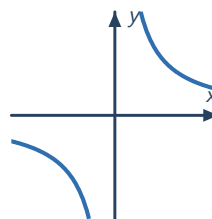
A



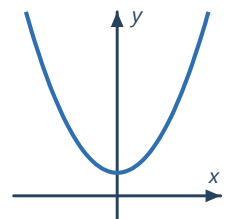
B



C



D



(a) $y = 2x + 1$

Answer: _____

(b) $y = x^2 + 1$

Answer: _____

(c) $y = x^3$

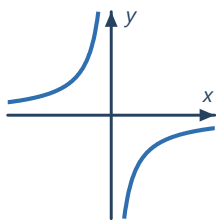
Answer: _____

(d) $y = \frac{4}{x}$

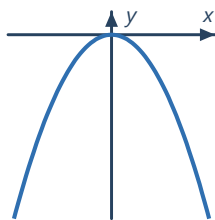
Answer:

3 Match each equation to its graph (A to D).

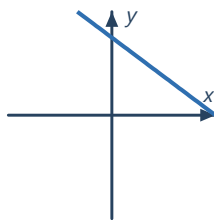
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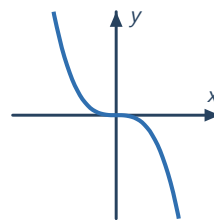
B



C



D



(a) $y = -x + 3$

Answer:

(b) $y = -x^2$

Answer:

(c) $y = -x^3$

Answer:

(d) $y = -\frac{2}{x}$

Answer:

4 Sketch each graph. Your sketch should show the correct shape.

(a) Sketch $y = x^2$

Answer:

(b) Sketch $y = -x^2$

Answer:

(c) Sketch $y = x^3$

Answer:

(d) Sketch $y = -x^3$

Answer:

(e) Sketch $y = \frac{2}{x}$

Answer:

(f) Sketch $y = -\frac{2}{x}$

Answer:

5 Which graph could be $y = x^2 - 3$? A: crosses the y-axis at (0, 3), U-shaped. B: crosses the y-axis at (0, -3), U-shaped. C: crosses the y-axis at (0, -3), n-shaped.

Answer:

6 Write **true** or **false** for each statement. Give a reason.

(a) A quadratic graph is always U-shaped.

Answer:

(b) The graph of $y = 2x + 5$ is a curve.

Answer:

(c) The graph of $y = x^3$ goes through $(-1, -1)$.

Answer:

(d) The graph of $y = 4 \div x$ has a point with $x = 0$.

Answer:

7 Which of these graphs has a turning point: $y = 2x + 1$, $y = x^2 - 3$, $y = x^3$, $y = 1 \div x$?

Answer:

8 Which of these points lie on the graph of $y = x^3$?

(a) $(2, 8)$

Answer:

(b) $(-2, -8)$

Answer:

(c) $(1, 2)$

Answer:

(d) $(-1, 1)$

Answer:

9 A graph is n-shaped, crosses the y -axis at 4 and crosses the x -axis at -2 and 2 . Which equation could it be? $y = x^2 - 4$, $y = 4 - x^2$, $y = x^2 + 4$, $y = 4 \div x$.

Answer:

10 Ravi says the graph of $y = x^2 + 1$ passes through the origin. Show that he is wrong.

Answer:

11 Use the values of $x = 2$ and $x = -2$ to explain the difference between the shapes of $y = x^2$ and $y = x^3$.

Answer:

12 A parabola crosses the x -axis at $(-3, 0)$ and $(1, 0)$ and crosses the y -axis at $(0, 3)$. Which equation could it be? $y = (x - 1)(x + 3)$, $y = -(x - 1)(x + 3)$, $y = (x + 1)(x - 3)$, $y = -(x + 1)(x - 3)$.

Answer:

13 Sketch the graph of (a) $y = x^3 - 4x$ and (b) $y = 4x - x^3$. For each, show where it crosses the x -axis (you may use $x(x^2 - 4) = 0$).

(a) $y = x^3 - 4x$

Answer:

(b) $y = 4x - x^3$

Answer:

14 Zara says: "Every graph of the form $y = ax^2 + c$ is symmetrical about the y -axis." Show that she is right by comparing the y -values for x and $-x$.

Answer:

