

GCSE Maths: Cubic and reciprocal graphs (Higher): answers

GCSE Maths - Quadratic and Other Graphs - Higher - Lesson 13.4

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch13-quadratic-other-graphs/higher/cubic-and-reciprocal-graphs/

Exercise 13D Cubic and reciprocal graphs Non-calculator

- 1 Complete the table of values for $y = x^3 + 2$.

x	-3	-2	-1	0	1	2	3
y			1		3		

Answer:

x	-3	-2	-1	0	1	2	3
y	-25	-6	1	2	3	10	29

- 2 Complete the table of values for $y = 2x^3$.

x	-2	-1	0	1	2
y					

Answer:

x	-2	-1	0	1	2
y	-16	-2	0	2	16

- 3 Complete the table of values for $y = -x^3$.

x	-2	-1	0	1	2
y					

Answer:

x	-2	-1	0	1	2
y	8	1	0	-1	-8

- 4 (a) Complete the table of values for $y = x^3$. (b) Draw the graph of $y = x^3$ for values of x from -2 to 2.

x	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
y									

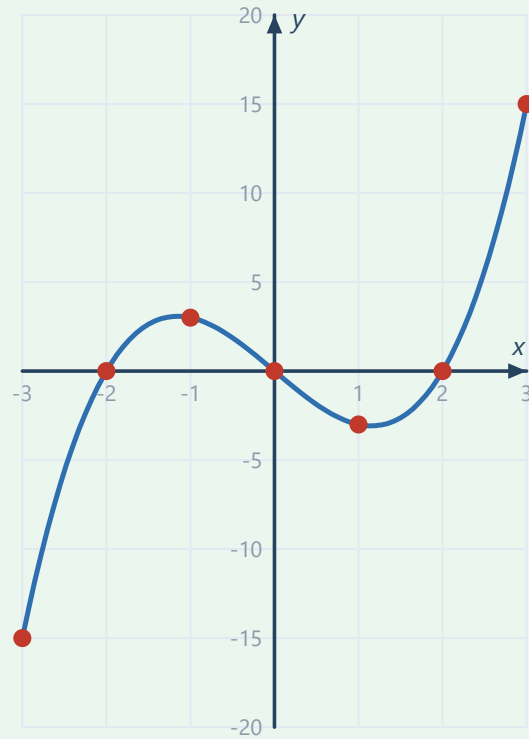
Answer: Points: $(-2, -8)$, $(-1.5, -3.375)$, $(-1, -1)$, $(-0.5, -0.125)$, $(0, 0)$, $(0.5, 0.125)$, $(1, 1)$, $(1.5, 3.375)$, $(2, 8)$.



- 5 (a) Complete the table of values for $y = x^3 - 4x$. (b) Draw the graph of $y = x^3 - 4x$ for values of x from -3 to 3 .

x	-3	-2	-1	0	1	2	3
y							

Answer: Points: $(-3, -15)$, $(-2, 0)$, $(-1, 3)$, $(0, 0)$, $(1, -3)$, $(2, 0)$, $(3, 15)$.



6 Complete the table of values for $y = 1 \div x$. Give y as a decimal.

x	-4	-2	-1	-0.5	0.5	1	2	4
y								

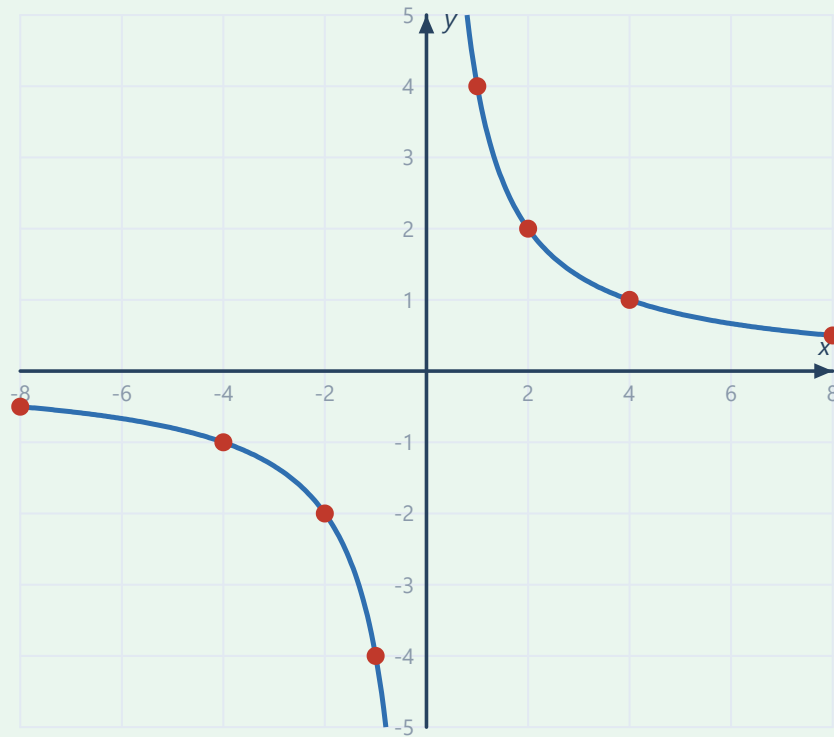
Answer:

x	-4	-2	-1	-0.5	0.5	1	2	4
y	-0.25	-0.5	-1	-2	2	1	0.5	0.25

7 (a) Complete the table of values for $y = \frac{4}{x}$. (b) Draw the graph of $y = \frac{4}{x}$ for values of x from -8 to 8 (but not 0).

x	-8	-4	-2	-1	1	2	4	8
y								

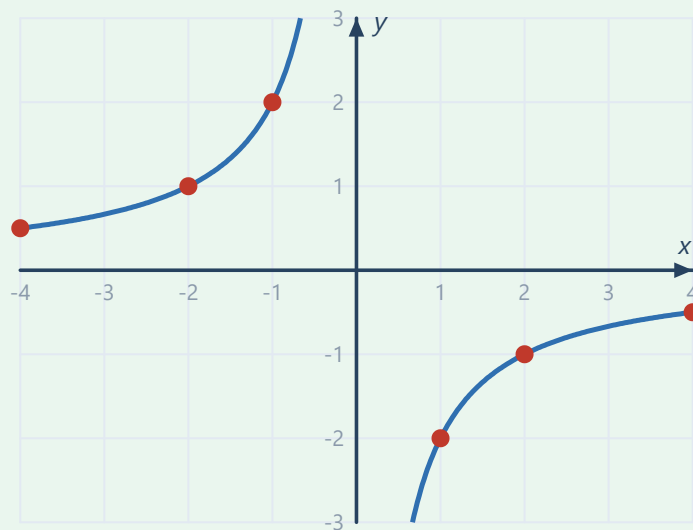
Answer: Points: $(-8, -0.5)$, $(-4, -1)$, $(-2, -2)$, $(-1, -4)$, $(1, 4)$, $(2, 2)$, $(4, 1)$, $(8, 0.5)$.



- 8 (a) Complete the table of values for $y = -\frac{2}{x}$. (b) Draw the graph of $y = -\frac{2}{x}$ for values of x from -4 to 4 (but not 0).

x	-4	-2	-1	1	2	4
y						

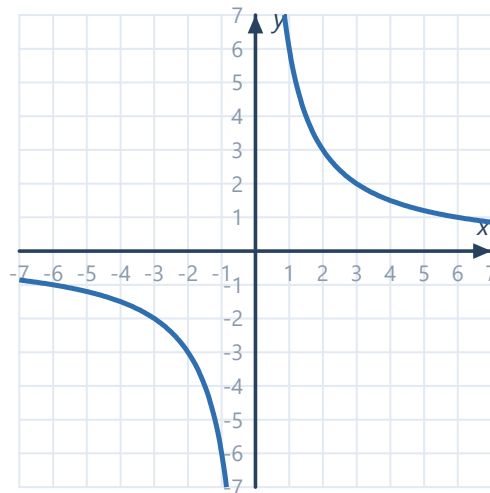
Answer: Points: $(-4, 0.5)$, $(-2, 1)$, $(-1, 2)$, $(1, -2)$, $(2, -1)$, $(4, -0.5)$.



- 9 Gemma tries to complete a table for $y = 1 \div x$ and cannot work out y when $x = 0$. Explain why, and say what this means for the graph.

Answer: You cannot divide by zero, so the graph has no point at $x = 0$

- 10 Here is the graph of $y = 6 \div x$. Use the graph to find (a) y when $x = 2$, (b) y when $x = -3$, (c) x when $y = 1.5$, (d) x when $y = -2$.



- (a) y when $x = 2$

Answer: $y = 3$

- (b) y when $x = -3$

Answer: $y = -2$

- (c) x when $y = 1.5$

Answer: $x = 4$

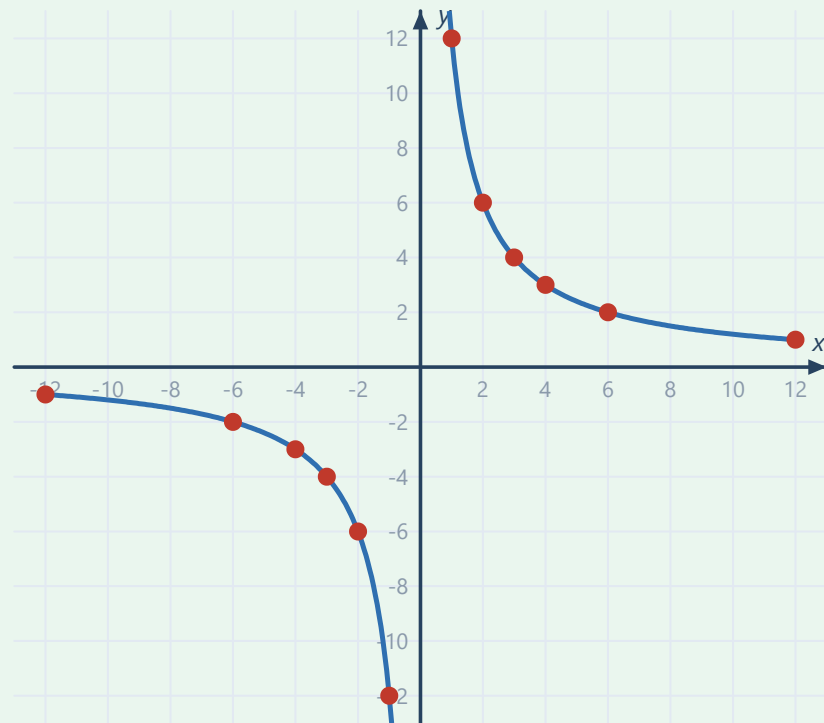
- (d) x when $y = -2$

Answer: $x = -3$

- 11 Two numbers x and y multiply to give 12, so $y = 12 \div x$. (a) Complete the table of values. (b) Draw the graph. (c) Use your graph to find x when $y = 5$.

x	-12	-6	-4	-3	-2	-1	1	2	3	4	6	12
y												

Answer: Points: $(-12, -1)$, $(-6, -2)$, $(-4, -3)$, $(-3, -4)$, $(-2, -6)$, $(-1, -12)$, $(1, 12)$, $(2, 6)$, $(3, 4)$, $(4, 3)$, $(6, 2)$, $(12, 1)$.



(c) $x = 2.4$

12 Write **true** or **false** for each statement and explain your answer.

- (a) The graph of $y = x^3$ passes through the origin.

Answer: True

- (b) The graph of $y = 1 \div x$ crosses the y-axis.

Answer: False

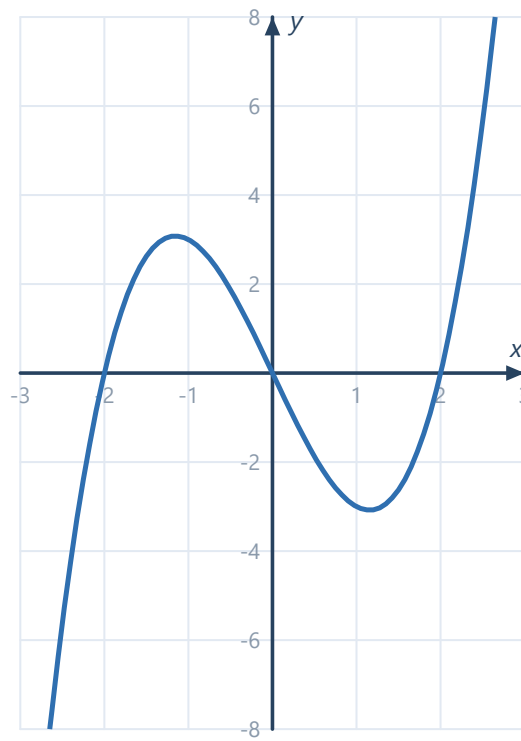
- (c) The graph of $y = x^3$ is U-shaped.

Answer: False

- (d) When x is negative, $y = x^3$ is negative.

Answer: True

13 Use the graph of $y = x^3 - 4x$ to (a) write down the roots of $x^3 - 4x = 0$, (b) find estimates of the solutions of $x^3 - 4x = 1$, to 1 decimal place.



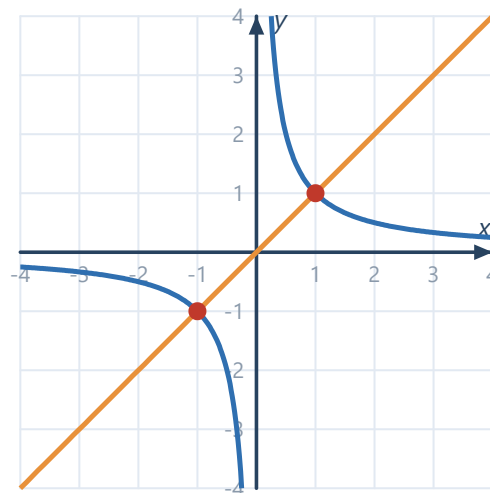
(a) the roots

Answer: $x = -2, 0$ or 2

(b) $x^3 - 4x = 1$

Answer: $x \approx -1.9, -0.3$ or 2.1 (accept answers within 0.1)

- 14** The curves $y = 1 \div x$ and the line $y = x$ are drawn on the grid. (a) Write down the coordinates of the points where they cross. (b) Show that these are the solutions of $1 \div x = x$.



(a) the crossing points

Answer: $(1, 1)$ and $(-1, -1)$

(b) show they solve $1/x = x$

Answer: Both sides are 1 at $x = 1$ and -1 at $x = -1$