

Relations and Functions: math test, Grade 9 – download the PDF

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Relations

/ 4 pts

Let $S = \{(0, 6), (1, 4), (2, 6), (5, -3)\}$.

- Give the domain and the range of S .
- Is S a function? Explain.
- Which inputs have the output 6?
- Change one pair so that S is no longer a function.

2 Function notation

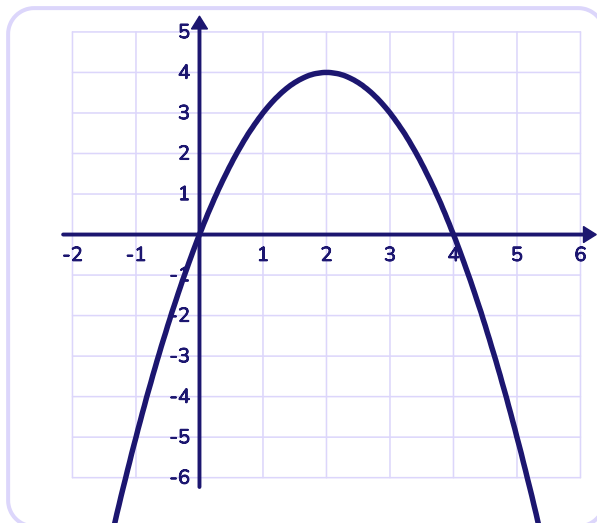
/ 4 pts

Let $f(x) = -2x + 9$. Find (a) $f(3)$, (b) $f(-4)$, (c) x such that $f(x) = 1$, (d) x such that $f(x) = -5$.

3 Reading a graph

/ 4 pts

The graph shows a function h for $-1 \leq x \leq 5$, where $h(x) = -x^2 + 4x$.



- Read $h(2)$.
- Find the x -values where $h(x) = 0$.
- Find the x -values where $h(x) = 3$.
- Give the range of h for $-1 \leq x \leq 5$.

4 Table and rule

/ 3 pts

A linear function f is given by this table.

x	0	2	4	6
$f(x)$	1	7	13	19

- Give the domain and the range of the table.
- Find the rule $f(x)$.
- Compute $f(15)$.

5

Arithmetic sequence

/ 3 pts

Consider the sequence $11, 8, 5, \dots$, which is arithmetic.

- Find the common difference and the rule a_n .
- Find a_9 .
- Find the first negative term.

6

Gym membership

/ 2 pts

A gym charges a 25-dollar sign-up fee plus 12 dollars per month. Calculator allowed.

- Write the cost function $C(m)$ and find $C(8)$.
- With a budget of 200 dollars, what is the greatest number of whole months you can afford?

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