Comparing Functions Worksheet

Algebra 1 · Common Core HSF-IF.C.9

> Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.

Practice

Builds the skill step by step.

1. $f(x) = 2x + 3$. The table shows g: $x = 0, 1, 2$ and $g(x) = 1, 5, 9$. Which function has the greater slope?

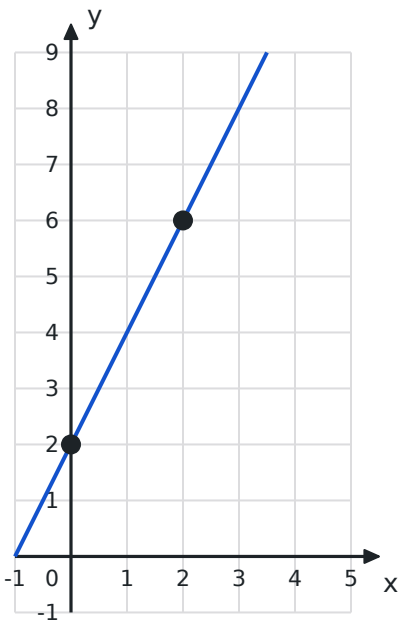
   A. g

   B. f

   C. They are equal.

   D. You can't tell.

2. f(x) = 3x + 5. The graph shows g. Which function has the greater y-intercept?



A. g

B. You can't tell.

C. f

D. They are equal.

3. f(x) = $-(x-2)^2$ + 6. The table shows g: x = 1, 2, 3 and g(x) = 7, 8, 7, with 8 its maximum. Which has the greater maximum?

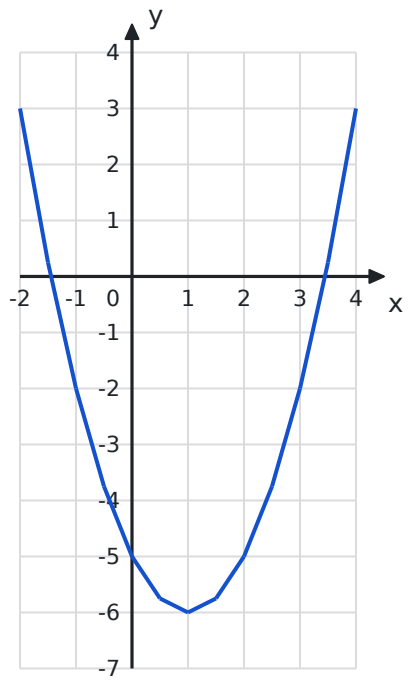
A. You can't tell.

B. f

C. They are equal.

D. g

4. $f(x) = x^2 - 4$. The graph shows g. What is the smaller of the two minimum values?



5. Plan A costs 20 + 5x dollars for x units. Plan B costs 8 dollars per unit with no fee. For 10 units, how much less does the cheaper plan cost?

6. $f(x) = 1.1^x$ and g(x) = 100x. Which will be greater for very large x?

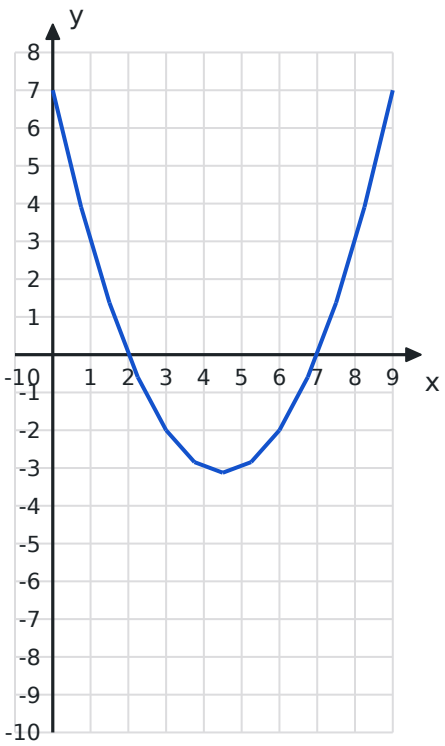
   A. g

   B. f

   C. You can't tell.

   D. They stay equal.

7. f(x) = (x − 1)(x − 5). The graph shows g. What is the largest zero of the two functions?



8. f(x) = 3x. g starts at 10 and increases by 2 for each 1 unit increase in x. At what x are they equal?

9. The table shows f: f(0) = 3 and f(2) = 11. g(x) = 5x. How much greater is g's average rate of change from x = 0 to x = 2?

10. $f(x) = 4 \cdot 2^x$ and $g(x) = 3^x$. Which has the greater y-intercept?

    A. g

    B. They are equal.

    C. f

    D. You can't tell.

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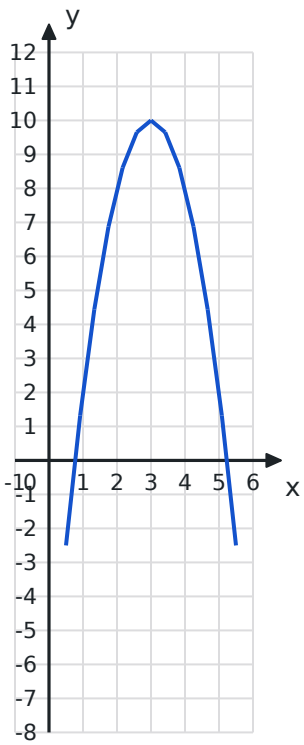
On Level

Grade-level practice.

1. $f(x) = -2x^2 + 8x + 1$. The graph shows g. What is the larger of the two maximum values?



2. Car A's distance is d = 55t miles. A table shows Car B at 0, 60 and 120 miles after 0, 1 and 2 hours. How many miles per hour faster is the faster car?

3. $f(x) = 2^x$ and $g(x) = 10x$. What is the smallest whole number $x \geq 1$ for which $f(x)$ is greater than $g(x)$?

4. $f(x) = x^2$. The table shows g: $g(0) = 1$ and $g(4) = 21$. Which has the greater average rate of change from $x = 0$ to $x = 4$?

   A. You can't tell.

   B. f

   C. They are equal.

   D. g

5. Ana's savings are $A(w) = 100 + 20w$ dollars after w weeks. Ben's savings table shows 0, 35, 70 and 105 dollars after weeks 0, 1, 2 and 3, increasing by the same amount each week. Who has more after 10 weeks, and by how much?

6. $f(x) = |x - 3|$ and $g(x) = x^2 - 2x$. What is the smaller of the two minimum values?

7. $f(x) = 5(0.8)^x$. g's graph crosses the y-axis at (0, 6). What is the greater y-intercept?

8. $f(x) = 3x - 2$. g is a linear function, and a table shows $g(1) = 0$. Which function has the larger zero, and what is that zero?

9. $f(x) = 100x$ and $g(x) = 1.05^x$. Which grows faster in the long run?

   A. f

   B. g

   C. You can't tell.

   D. They grow at the same rate.

10. $f(x) = x^2 - 6x + 10$. g has vertex $(3, -2)$ and opens up. How much greater is f's minimum than g's?

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Challenge

Multi-step and word problems that stretch it.

1. $f(x) = 50(1.1)^x$. A table shows g: 50, 56 and 62.72 at x = 0, 1 and 2. What is the growth rate of the faster-growing function, as a percent?

2. $f(t) = -16t^2 + 64t$ is one ball's height in feet. A second ball reaches a maximum height of 70 feet. How much higher does the second ball go?

3. $f(x) = 4x + 20$ and $g(x) = 2^x$. What is the smallest whole number x for which g(x) is greater than f(x)?

4. $f(x) = (x - 2)(x - 8)$. g has zeros -1 and 7. How far apart are their axes of symmetry?

5. Plan A costs a flat 40 dollars a month. Plan B costs 0.25 dollars per minute. At how many minutes do they cost the same?

6. $f(x) = x^3$ and $g(x) = 10x$. Which has the greater average rate of change from $x = 1$ to $x = 3$?

   A. f

   B. g

   C. They are equal.

   D. You can't tell.

7. $f(x) = 2x^2$. A table shows g: 0, 1, 4 and 9 at $x = 0$, 1, 2 and 3. What is $f(3) \div g(3)$?

8. $f(x) = -(x - 4)^2 + 12$. The graph of g is a parabola that opens down with vertex (5, 10). Which has the greater maximum, and by how much?

9. $f(t) = 800(0.5)^t$ and $g(t) = 800 - 100t$. What is $g(3) - f(3)$?

10. h starts at 5 and triples each step. $k(x) = 5 \cdot 2^x$. Which grows faster?

    A. k

    B. They grow at the same rate.

    C. You can't tell.

    D. h