

CP Unit 2 Study Guide

Matching: Be able to match each parent function graph with its equation (9 questions).

Multiple choice (18 questions)

1. If the graph of $f(x) = 0.5^x$ is shifted 3 units down, what would be the graph of the new function?

$g(x) = 0.5^x - 3$

2. If the graph of $f(x) = 2^x$ is shifted 4 units up, what would be the equation of the new graph?

$g(x) = 2^x + 4$

3. Which parent function was transformed to create the function $f(x) = 2x^2 - 5$?

$f(x) = x^2$ **Quadratic**

4. What is the range of the quadratic parent function?

$[0, +\infty)$

5. Is the exponential growth function odd, even, or **neither**?

6. Which describes the end behavior of a constant function?

as $x \rightarrow +\infty, f(x) \rightarrow b$ as $x \rightarrow -\infty, f(x) \rightarrow b$

7. Which parent functions have an asymptote?

Exponential growth 2^x + decay $\frac{1}{2^x}$ and reciprocal $\frac{1}{x}$

8. Is the cube root parent function **increasing**, decreasing, both, or neither?

9. Is the quadratic function odd, even, or neither?

even

10. Which parent function is illustrated in the table of values?

$f(x) = x$ **linear**

| x | f(x) |
|----|------|
| -2 | -2 |
| -1 | -1 |
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |

Short answer (10 questions)

1. Describe the transformation: $g(x) = f(x) - 5$

Vertical shift down 5

2. Describe the transformation: $g(x) = f(x-3)$

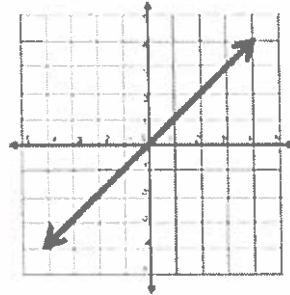
Horizontal shift right 3

3. Describe the transformation: $g(x) = -2f(x)$

Vertical
Flipped + stretch by 2

4. Describe the end behavior of the function in the graph.

as $x \rightarrow +\infty, f(x) \rightarrow +\infty$
as $x \rightarrow -\infty, f(x) \rightarrow -\infty$



5. Write an equation for the translation of the parent function $f(x) = x^2$. The parent function has been translated 3 units up.

$$x^2 + 3$$

6. Create an quadratic function that shifts 2 units up. Use the parent function $f(x) = x^2$

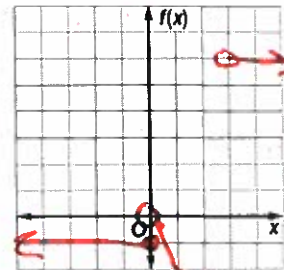
$$x^2 + 2$$

7. Campbell says that the linear function is decreasing. Is she correct? Explain.

The parent function is increasing, but another linear one could be decreasing.

8. Graph the following piecewise function.

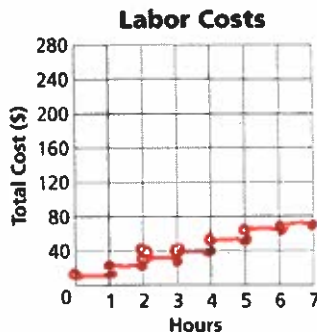
$$f(x) = \begin{cases} -1 & \text{if } x \leq 0 \\ -2x & \text{if } 0 < x \leq 3 \\ 6 & \text{if } x > 3 \end{cases}$$



9. Evaluate the piecewise function in #8 for $f(-5)$, $f(-1)$, $f(0)$, and $f(2)$

$$f(-5) = -1 \quad f(-1) = -1 \quad f(0) = -1 \quad f(2) = -4$$

10. **BUSINESS** A *Stitch in Time* charges \$10 per hour or any fraction thereof for labor. Draw a graph of the step function that represents this situation.



a) How much would A *Stitch in Time* charge for 4 hours?

\$40

b) How much would A *Stitch in Time* charge for 8 hours and 35 minutes?

\$90