

# LESSON

# 23

# Parent Functions

## LEARNING OBJECTIVES

- Today I am: watching a YouTube Video about parent functions.
- So that I can: identify the most important aspects of each parent function.
- I'll know I have it when I can: determine the parent function of  $f(x) = \sqrt{4x - 1}$ .

## Opening Exercise

1. Watch the YouTube video *Math Shorts #1 "Parent Functions"* at <https://www.youtube.com/watch?v=58ZmkhlanZA>. Then answer the questions below.

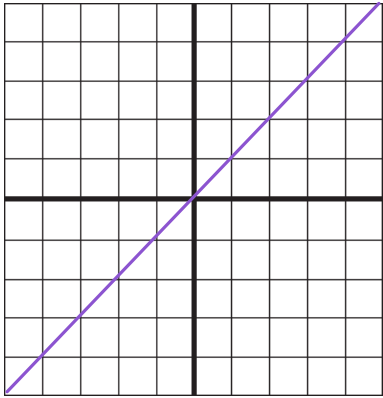
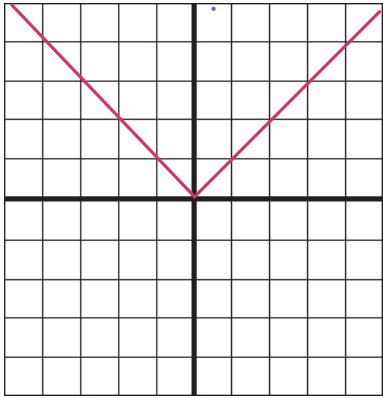
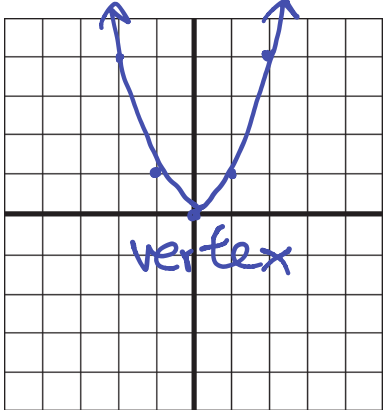
A. List three facts from the video about all parent functions.

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B. Complete the table of parent functions and their facts.

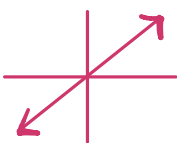
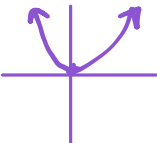
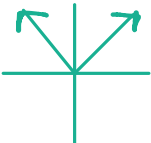

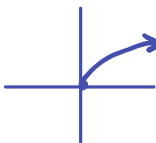
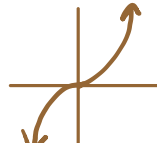
| Name           | Equation  | Graph   | One other fact about this function   |
|----------------|-----------|---|--|
| Linear         | $y = x$   |    | <ul style="list-style-type: none"> <li>• <math>y = mx + b</math></li> <li>• <math>m = \text{slope (steepness)}</math></li> <li>• <math>b</math> moves the line up or down.</li> </ul>  |
| Absolute Value | $y =  x $ |   | <ul style="list-style-type: none"> <li>• <math>y = a x-h  + k</math></li> <li>• "<math>a</math>" steepness</li> <li>• "<math>h</math>" → horizontal shift</li> <li>• "<math>k</math>" → vertical shift</li> <li>• vertex: <math>(h, k)</math></li> </ul> |
| Quadratic      | $y = x^2$ |  | <ul style="list-style-type: none"> <li>• <math>y = ax^2 + bx + c</math></li> <li>• "<math>a</math>" → narrow or wide</li> <li>• "<math>c</math>" → up or down.</li> <li>• vertex</li> </ul>  |

The video showed three of the parent functions we'll be exploring in this lesson. Quadratic functions are one type that you may not have seen before. Quadratic functions are so important that the next module is devoted just to them. In the next activity, you'll use six of the most essential parent functions studied in algebra. And like quadratic functions there are some that you may have never seen before or only worked with slightly.

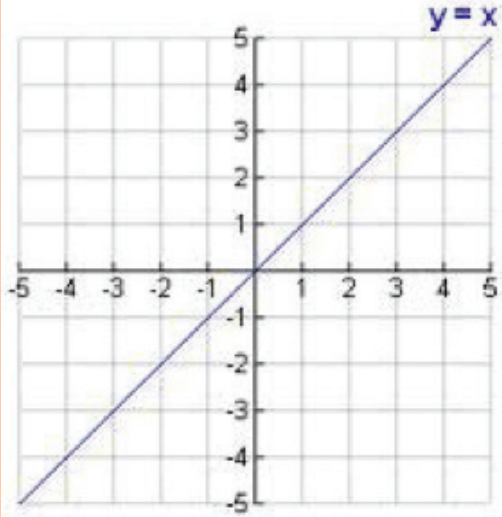
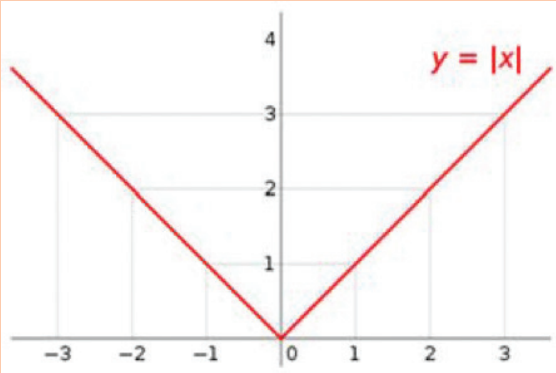
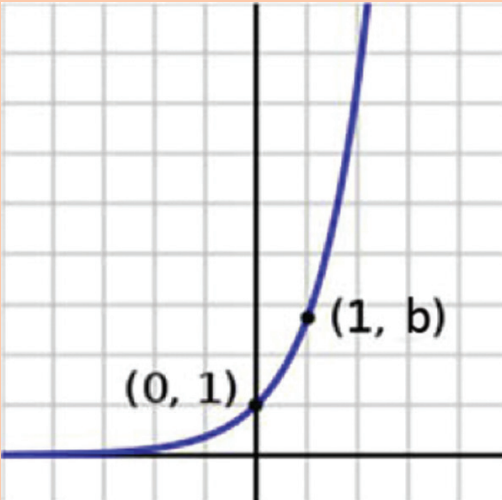
**Matching Exploration—Parent Functions**

You will need: *Parent Functions* activity cards

2. The *Parent Function* activity cards only contain the equations, tables of values and graphs of the six functions. Determine which cards go with each function and then fill in the chart below. Use the names of the functions to help you. There are no cards for domain and range. You'll need to determine those values on your own.

| Linear   | Quadratic   | Absolute Value  | Exponential  | Square Root   | Cubic   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
|--|---|---|--|---|---|----|---|---|---|---|---|---|--|---|------|----|---|----|---|---|---|---|---|---|---|--|---|------|----|---|----|---|---|---|---|---|---|---|--|---|------|----|-----|----|-----|---|---|---|---|---|---|---|---|------|---|---|---|---|---|---|---|---|----|---|--|---|------|----|----|----|----|---|---|---|---|---|---|
| Equation:<br>$f(x) = x$  | Equation:<br>$f(x) = x^2$<br>✓  | Equation:<br>$f(x) =  x $<br>✓  | Equation:<br>$f(x) = 2^x$<br>✓   | Equation:<br>$f(x) = \sqrt{x}$  | Equation:<br>$f(x) = x^3$   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| <table border="1"> <thead> <tr><th>x</th><th>f(x)</th></tr> </thead> <tbody> <tr><td>-2</td><td>-2</td></tr> <tr><td>-1</td><td>-1</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>2</td><td>2</td></tr> </tbody> </table> | x   | f(x)  | -2   | -2  | -1  | -1 | 0 | 0 | 1 | 1 | 2 | 2 | <table border="1"> <thead> <tr><th>x</th><th>f(x)</th></tr> </thead> <tbody> <tr><td>-2</td><td>4</td></tr> <tr><td>-1</td><td>1</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>2</td><td>4</td></tr> </tbody> </table> | x | f(x) | -2 | 4 | -1 | 1 | 0 | 0 | 1 | 1 | 2 | 4 | <table border="1"> <thead> <tr><th>x</th><th>f(x)</th></tr> </thead> <tbody> <tr><td>-2</td><td>2</td></tr> <tr><td>-1</td><td>1</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>2</td><td>2</td></tr> </tbody> </table> | x | f(x) | -2 | 2 | -1 | 1 | 0 | 0 | 1 | 1 | 2 | 2 | <table border="1"> <thead> <tr><th>x</th><th>f(x)</th></tr> </thead> <tbody> <tr><td>-2</td><td>1/4</td></tr> <tr><td>-1</td><td>1/2</td></tr> <tr><td>0</td><td>1</td></tr> <tr><td>1</td><td>2</td></tr> <tr><td>2</td><td>4</td></tr> </tbody> </table> | x | f(x) | -2 | 1/4 | -1 | 1/2 | 0 | 1 | 1 | 2 | 2 | 4 | <table border="1"> <thead> <tr><th>x</th><th>f(x)</th></tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>4</td><td>2</td></tr> <tr><td>9</td><td>3</td></tr> <tr><td>16</td><td>4</td></tr> </tbody> </table> | x | f(x) | 0 | 0 | 1 | 1 | 4 | 2 | 9 | 3 | 16 | 4 | <table border="1"> <thead> <tr><th>x</th><th>f(x)</th></tr> </thead> <tbody> <tr><td>-2</td><td>-8</td></tr> <tr><td>-1</td><td>-1</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>2</td><td>8</td></tr> </tbody> </table> | x | f(x) | -2 | -8 | -1 | -1 | 0 | 0 | 1 | 1 | 2 | 8 |
| x  | f(x)  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -2   | -2  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -1   | -1  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 0  | 0   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 1  | 1   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 2  | 2   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| x  | f(x)  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -2   | 4   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -1   | 1   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 0  | 0   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 1  | 1   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 2  | 4   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| x  | f(x)  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -2   | 2   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -1   | 1   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 0  | 0   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 1  | 1   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 2  | 2   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| x  | f(x)  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -2   | 1/4   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -1   | 1/2   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 0  | 1   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 1  | 2   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 2  | 4   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| x  | f(x)  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 0  | 0   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 1  | 1   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 4  | 2   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 9  | 3   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 16   | 4   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| x  | f(x)  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -2   | -8  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| -1   | -1  |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 0  | 0   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 1  | 1   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| 2  | 8   |   |  |   |   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| Graph:<br>  | Graph:<br> | Graph:<br> | Graph:<br> | Graph:<br> | Graph:<br> |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| Domain:<br>$(-\infty, \infty)$   | Domain:<br>$(-\infty, \infty)$  | Domain:<br>$(-\infty, \infty)$  | Domain:<br>$(-\infty, \infty)$   | Domain:<br>$[0, \infty)$  | Domain:<br>$(-\infty, \infty)$  |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |
| Range:<br>$(-\infty, \infty)$  | Range:<br>$[0, \infty)$   | Range:<br>$[0, \infty)$   | Range:<br>$(0, \infty)$  | Range:<br>$[0, \infty)$   | Range:<br>$(-\infty, \infty)$   |    |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |   |    |   |   |   |   |   |   |   |  |   |      |    |     |    |     |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |    |   |  |   |      |    |    |    |    |   |   |   |   |   |   |

## Lesson Summary

| Function Name  | Parent Function  | Graph of Parent Functions  |
|----------------|------------------|--|
| Linear         | $y = f(x) = x$   |    |
| Absolute Value | $y = f(x) =  x $ |   |
| Exponential    | $y = b^x$        |  |

NAME: \_\_\_\_\_ PERIOD: \_\_\_\_\_ DATE: \_\_\_\_\_

# Homework Problem Set

For each equation below, decide which parent function most closely resembles the given equation. Use the answer bank below for your choices. You may use the same parent function name multiple times.

|           |              |                   |                |                |          |
|-----------|--------------|-------------------|----------------|----------------|----------|
| A. Linear | B. Quadratic | C. Absolute Value | D. Exponential | E. Square Root | F. Cubic |
|-----------|--------------|-------------------|----------------|----------------|----------|

1.  $f(x) = 2x + 3$

2.  $f(x) = 2x^2 + 3$

3.  $f(x) = 2|x| + 3$

4.  $f(x) = \sqrt{4x - 1}$

5.  $f(x) = |4x - 1|$

6.  $f(x) = 4^x - 1$

7.  $f(x) = -|x| + 7$

8.  $f(x) = -x^2 + 7$

9.  $f(x) = -x + 7$

For each function, calculate  $f(1)$ ,  $f(0)$  and  $f(-1)$ .

10.  $f(x) = \sqrt{4x - 1}$

11.  $f(x) = |4x - 1|$

12.  $f(x) = 4^x - 1$

$f(1) =$

$f(1) =$

$f(1) =$

$f(0) =$

$f(0) =$

$f(0) =$

$f(-1) =$

$f(-1) =$

$f(-1) =$

13.  $f(x) = 2x + 3$

$f(1) =$

$f(0) =$

$f(-1) =$

14.  $f(x) = 2x^3 + 3$

$f(1) =$

$f(0) =$

$f(-1) =$

15.  $f(x) = 2|x| + 3$

$f(1) =$

$f(0) =$

$f(-1) =$

16.  $f(x) = -|x| + 7$

$f(1) =$

$f(0) =$

$f(-1) =$

17.  $f(x) = -x^2 + 7$

$f(1) =$

$f(0) =$

$f(-1) =$

18.  $f(x) = -x + 7$

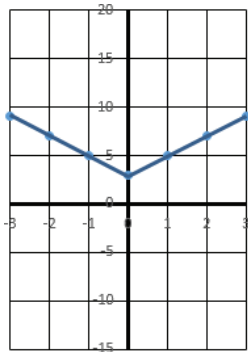
$f(1) =$

$f(0) =$

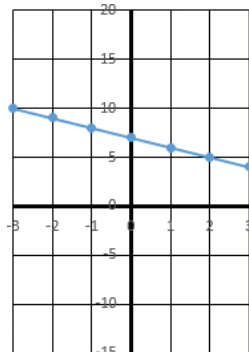
$f(-1) =$

**For Problems 19–24, match each graph with one of the equations from Problems 13–18.**

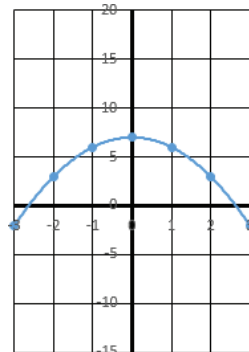
19. Equation from Problem \_\_\_\_\_



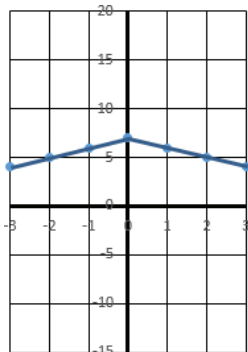
20. Equation from Problem \_\_\_\_\_



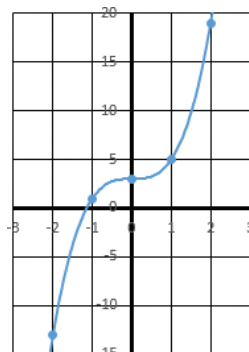
21. Equation from Problem \_\_\_\_\_



22. Equation from Problem \_\_\_\_\_



23. Equation from Problem \_\_\_\_\_



24. Equation from Problem \_\_\_\_\_

