

Parent Linear Function $y = x$	Parent Quadratic Function $y = x^2$	Parent Cubic Function $y = x^3$	Parent nth power Function $y = x^n$
Parent Square Root Function $y = \sqrt{x}$	Parent Cube Root Function $y = \sqrt[3]{x}$	Parent nth Root Function $y = \sqrt[n]{x}$	Parent natural base Function $y = e^x$
Parent base 10 Function $y = 10^x$	Parent base b Function $y = b^x$	Parent natural base LOG Function $y = \ln(x)$	Parent common base LOG Function $y = \log_{10} x$
Parent base b LOG Function $y = \log_b x$	Parent Reciprocal Function $y = \frac{1}{x}$	Parent Absolute Value Function $y =  x $	Parent Greatest Integer Function $y = \text{int}(x)$
Parent Logistic Function $y = \frac{1}{1 + e^{-x}}$	Parent Sine Function $y = \sin(x)$	Parent Cosine Function $y = \cos(x)$	Parent Tangent Function $y = \tan(x)$

I expanded our list to the TWENTY most basic functions that you would encounter in a PRE-CALCULUS COURSE

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Parent Square Root Function $y = \sqrt{x}$			Parent natural base Function $y = e^x$
		Parent natural base LOG Function $y = \ln(x)$	
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ANSWER the questions below using the NON-highlighted functions first

In Exercises 19–28, identify which of the *twelve basic functions* fit the description given.

19. The four functions that are odd
20. The six functions that are increasing on their entire domains
21. The three functions that are decreasing on the interval  $(-\infty, 0)$
22. The three functions with infinitely many local extrema
23. The three functions with no zeros
24. The three functions with range {all real numbers}
25. The four functions that do *not* have end behavior  
 $\lim_{x \rightarrow +\infty} f(x) = +\infty$
26. The three functions with end behavior  $\lim_{x \rightarrow +\infty} f(x) = -\infty$
27. The four functions whose graphs look the same when turned upside-down and flipped about the y-axis
28. The two functions whose graphs are identical except for a horizontal shift

In Exercises 45–50, identify which of the *twelve basic functions* fit the description given.

45. The two basic functions with graphs that are concave up on  $(-\infty, \infty)$ .
46. The two basic functions with graphs that are concave down on their entire domains.
47. The two basic functions with graphs that have a single point of inflection.
48. The two basic functions with graphs that have infinitely many points of inflection.

Now investigate the same questions using ONLY the highlighted functions

			Parent nth power Function $y = x^n$
	Parent Cube Root Function $y = \sqrt[3]{x}$	Parent nth Root Function $y = \sqrt[n]{x}$	
Parent base 10 Function $y = 10^x$	Parent base b Function $y = b^x$		Parent common base LOG Function $y = \log_{10} x$
Parent base b LOG Function $y = \log_b x$			
			Parent Tangent Function $y = \tan(x)$

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23. The ~~three~~ functions with no zeros
24. The ~~three~~ functions with range {all real numbers}
25. The ~~four~~ functions that do *not* have end behavior  
 $\lim_{x \rightarrow +\infty} f(x) = +\infty$
26. The ~~three~~ functions with end behavior  $\lim_{x \rightarrow -\infty} f(x) = -\infty$
27. The ~~four~~ functions whose graphs look the same when turned upside-down and flipped about the y-axis
28. The ~~two~~ functions whose graphs are identical except for a horizontal shift

In Exercises 45–50, identify which of the ~~twelve~~ basic functions fit the description given.

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