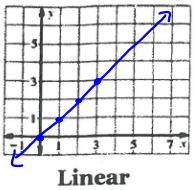
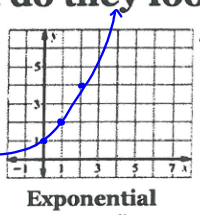
1. What are *parent functions* & what do they look like?



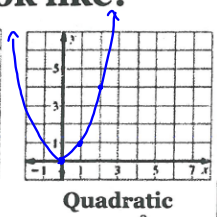
Linear
$y = x$

x	0	1	2	3
y	0	1	2	3



Exponential
$y = a^x$
Sample: $y = 2^x$

x	0	1	2	3
y	1	2	4	8

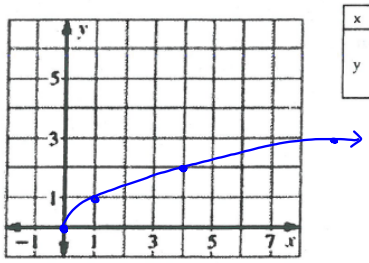


Quadratic
$y = x^2$

x	0	1	2	3
y	0	1	4	9

2. Graph the Square Root Parent Function

$y = \sqrt{x}$

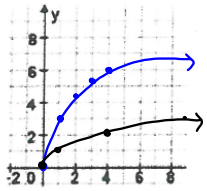


x	0	1	4	9
y	0	1	2	3

3. Your turn...

Graph the function $y = 3\sqrt{x}$ and identify its domain and range. Compare the graph with the graph of $y = \sqrt{x}$ *which you graphed on #2.* Vertical stretch

Make a table, state the domain and range & plot the points.
(round values to the nearest tenth)



x	0	1	2	3	4
y	0	3	4.24	5.2	6

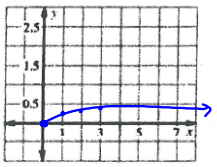
Domain: $x \geq 0$

Range: $y \geq 0$

4.

Checkpoint Graph the function and identify its domain and range. Compare the graph with the graph of $y = \sqrt{x}$.

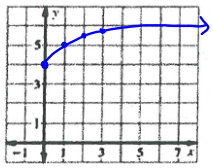
1. $y = 0.25\sqrt{x}$



x	0	1	2	3
y	0	.25	.35	.43

Vertical Shrink
D: $x \geq 0$
R: $y \geq 0$

2. $y = \sqrt{x} + 4$



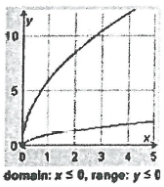
x	0	1	2	3
y	4	5	5.4	5.73

Shifted up 4
D: $x \geq 0$
R: $y \geq 4$

5.

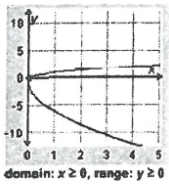
Graph the function $y = 6\sqrt{x}$ and identify its domain and range.
Compare the graph with the graph of $y = \sqrt{x}$.

○ A.



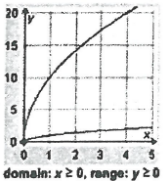
domain: $x \leq 0$, range: $y \leq 0$

○ C.



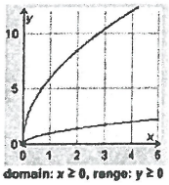
domain: $x \geq 0$, range: $y \geq 0$

○ B.



domain: $x \geq 0$, range: $y \geq 0$

○ D.

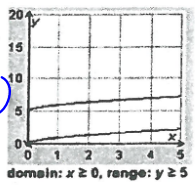


domain: $x \geq 0$, range: $y \geq 0$

6.

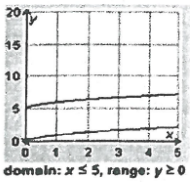
Graph the function $y = \sqrt{x} + 5$ and identify its domain and range.
Compare the graph with the graph of $y = \sqrt{x}$.

○ A.



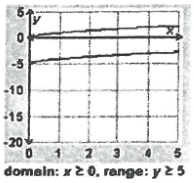
domain: $x \geq 0$, range: $y \geq 5$

○ C.



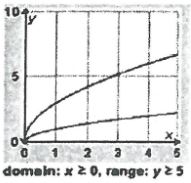
domain: $x \leq 5$, range: $y \geq 0$

○ B.



domain: $x \geq 0$, range: $y \geq 5$

○ D.



domain: $x \geq 0$, range: $y \geq 5$

1. Using a table...

What does inverse variation mean?

$xy = k$ When you multiply the x & y values of a function their product is constant (k).

What does direct variation mean?

$\frac{y}{x} = k$ When you divide the x & y values of a function their quotient is constant (k).

x	y	xy (inverse)	$\frac{y}{x}$ (direct)
1	12	12	12
2	6	12	3
3	4	12	4/3
4	3	12	3/4
		$xy =$ 12	$\frac{y}{x} =$ NO

Using a table...
Check for a constant k

1. **Multiply** your x & y values.

If not constant...

2. **Dividing** $\frac{y}{x}$.

2. Tell whether the table represents inverse variation.

If so, write the inverse variation equation.

x	y	xy (inverse)	$\frac{y}{x}$ (direct)
3	-8	-24	
6	-4	-24	
8	-3	-24	
12	-2	-24	$\frac{y}{x} =$ ___
		$xy =$ -24	

$xy = -24$

3. Using an equation...

What does *inverse variation* mean?

$xy = k$ An equation can be written with the x & y multiplied together to equal a constant (k) value.

What does *direct variation* mean?

$\frac{y}{x} = k$ An equation can be written with the y value being divided by the x value to equal a constant (k) value.

Using an equation... What do you get when you solve for k?

1. $xy = k$ —

If not does it look like this...

2. $\frac{y}{x} = k$ —

4. Tell whether the equation represents *direct variation*, *inverse variation*, or *neither*.

$xy = k$ ← inverse

$\frac{y}{x} = k$ ← direct

$x(y) = \left(\frac{2}{x}\right)x$

$xy = 2$

Inverse Variation

$k = 2$

5. Tell whether the equation represents *direct variation*, *inverse variation*, or *neither*.

$xy = k$

$\frac{y}{x} = k$

$\frac{y}{x} = \frac{2x}{x} + \frac{3}{x}$

$\frac{y}{x} = 2 + \frac{3}{x}$

Neither

6. Tell whether the equation represents *direct variation*, *inverse variation*, or *neither*.

$xy = k$

$\frac{y}{x} = k$

$\frac{4y}{x} = \frac{3x}{x}$

$4\frac{y}{x} = 3$

$\frac{y}{x} = \frac{3}{4}$

Direct Variation

$k = \frac{3}{4}$