



Graph Review (<http://goo.gl/rTQmCL>)
Essential Academic Skill Enhancement (EASE) workshop series



This workshop reviews the basics of algebra through pre-calculus to help prepare you for college calculus.

We will discuss:

- Graphing
 - Lines
 - Quadratics
 - Domain & Range
 - Exponential Functions
 - Trigonometry



Assessment Set 1:

1. Lines: Write the equation for a line through (-2, 1) and (4, -7)

$$\text{➤ } m = \frac{((-7) - (1))}{(4 - (-2))} = \frac{-8}{6} = -1\frac{1}{3}$$

$$\text{➤ } y = -\frac{8}{6}(x - (-2)) + 1$$

$$\text{➤ } y = -\frac{8}{6}(x + 2) + 1$$

$$\text{➤ } y = -\frac{8}{6}x - \frac{16}{6} + 1$$

$$\text{➤ } y = -\frac{8}{6}x - \frac{5}{3}$$

2. Quadratics: Find the vertex and intercepts, then graph: $y = x^2 - x - 12$

$$\text{➤ } y \text{ intercept: } y = (0)^2 - (0) - 12 = 0 - 0 - 12 = -12$$

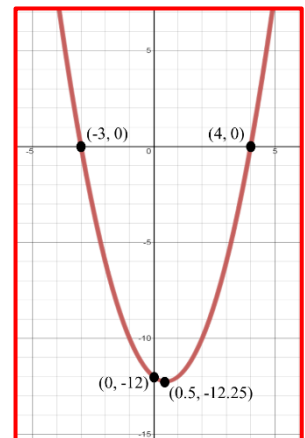
$$\text{➤ } x \text{ intercept: } 0 = x^2 - x - 12$$

$$0 = (x - 4)(x + 3)$$

$$x = 4 \text{ AND } x = -3$$

$$\text{➤ } \text{vertex: } h = -(-1)/2(1) \quad \text{and } k = (4(1)(-12) - (-1)^2)/4(1)$$

$$h = \frac{1}{2} = 0.5 \quad \text{and } k = -\frac{49}{4} = -12.25$$



3. Domain & Range: Find the domain and range of: $y = -\sqrt{-2x + 3}$

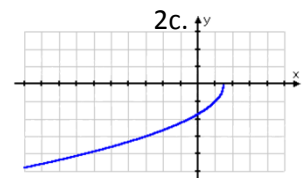
$$\text{➤ } \text{Domain: } -2x + 3 \geq 0$$

$$-2x \geq -3$$

$$2x \leq 3$$

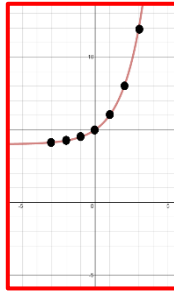
$$x \leq 3/2$$

$$\text{➤ } \text{Range: } y \leq 0$$



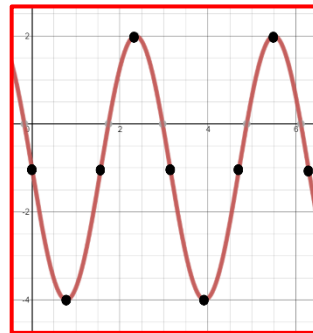
4. Exponential Functions: Evaluate and graph: $f(x) = 2^x + 4$, at $x = -3, -2, -1, 0, 1, 2,$ and 3 .

x	$f(x) = 2^x + 4$
-3	$2^{-3} + 4 = 1/8 + 4 = 4.125$
-2	$2^{-2} + 4 = 1/4 + 4 = 4.25$
-1	$2^{-1} + 4 = 1/2 + 4 = 4.5$
0	$2^0 + 4 = 1 + 4 = 5$
1	$2^1 + 4 = 2 + 4 = 6$
2	$2^2 + 4 = 4 + 4 = 8$
3	$2^3 + 4 = 8 + 4 = 12$



5. Trigonometry: Graph two periods of: $y = 3 \sin(2x - \pi) - 1$

- $A = 3$
- $B = (2\pi)/2 \rightarrow \pi = 3.14$
- $C = 2x - \pi \rightarrow 2(x - \pi/2) \therefore (\pi/2) = 1.57$
- $D = -1$



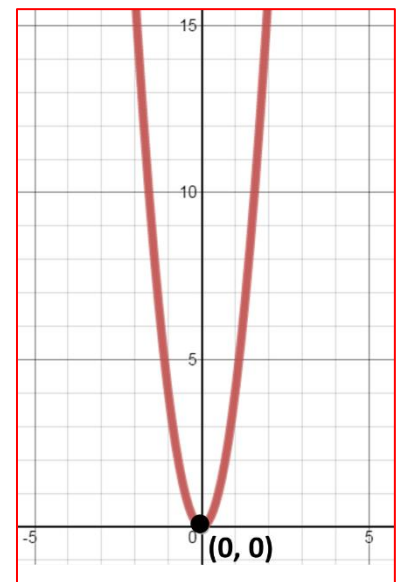
Assessment Set 2:

6. Lines: What is the correct slope and equation for a line that passes through $(-2, 7)$ and $(4, -2)$?

- $m = ((-2) - (7)) / (4 - (-2)) = -9/6 = -1\frac{1}{2}$
- $y = -\frac{9}{6}(x - (-2)) + 7$
- $y = -\frac{9}{6}(x + 2) + 7$
- $y = -\frac{9}{6}x - \frac{18}{6} + 7$
- $y = -\frac{9}{6}x + 4$

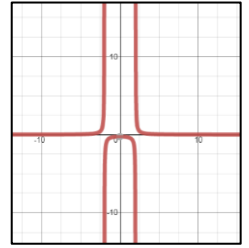
7. Quadratics: Find the vertex and intercepts, then graph: $y = 4x^2$

- y intercept: $y = 4(0)^2 = 0$
- x intercept: $0 = 4x^2$
 $x = 0$
- vertex: $h = -(0)/2(4)$ and $k = (4(4)(0) - (0)^2)/4(4)$
 $h = \frac{0}{8} = 0$ and $k = \frac{0}{16} = 0$



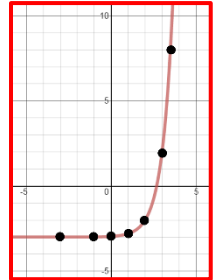
8. Domain & Range: Find the domain and range of: $y = 1/x^2 - 4$

- Domain: $x^2 - 4 \neq 0$
 $x^2 \neq 4$
 $x \neq \pm 2$
- Range: $y = \text{any real number}$



9. Exponential Functions: Evaluate and graph: $f(x) = 5^{x-2} - 3$, at $x = -3, -1, 0, 1, 2, 3, 3.5$.

x	$f(x) = 5^{x-2} - 3$
-3	-2.99968
-1	-2.992
0	-2.96
1	-2.8
2	-2
3	2
3.5	8.180339887



10. Trigonometry: Graph two periods of: $y = -4 \cos\left(-3x + \frac{5\pi}{6}\right) + 2$

- $A = 4$
- $B = (2\pi)/-3 = -2.09$
- $C = -3x + \frac{5\pi}{6} \rightarrow -3(x - \frac{5\pi}{6(-3)}) \therefore (5\pi/-18)/-3 = 5\pi/54 = 0.29$
- $D = 2$

