

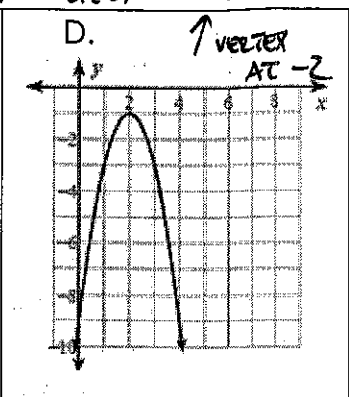
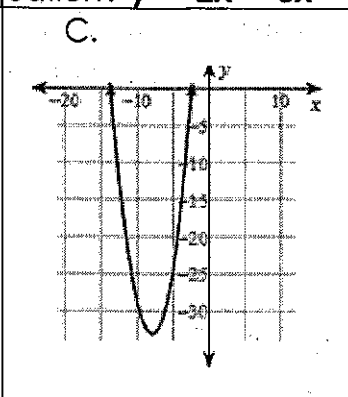
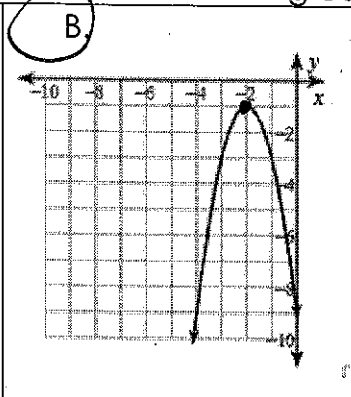
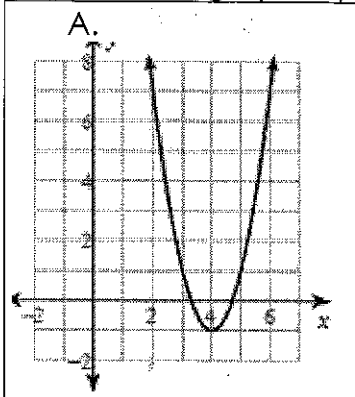
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Unit 3A review guide

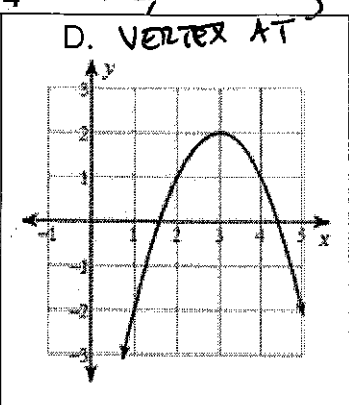
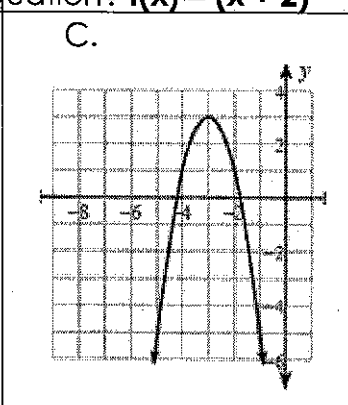
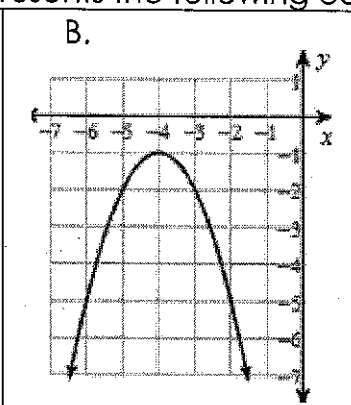
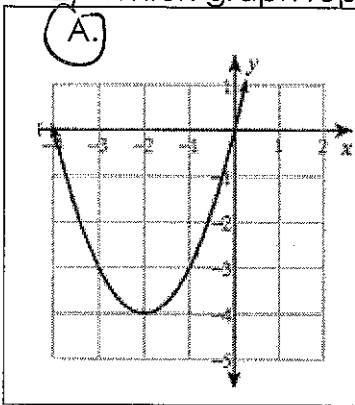
1) Which graph represents the following equation? $y = -2x^2 - 8x - 9$

$\frac{8}{2(-2)} = -2$



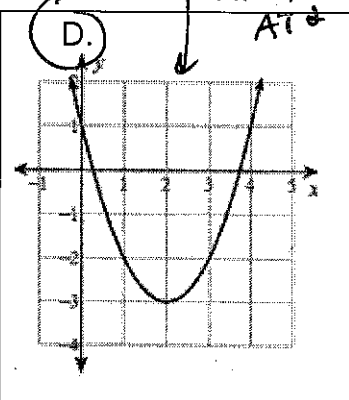
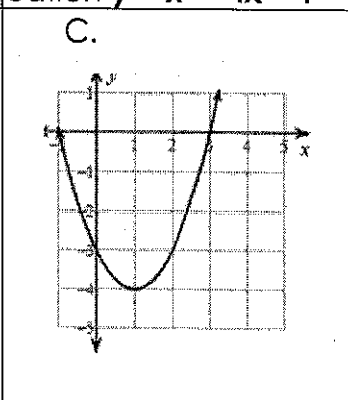
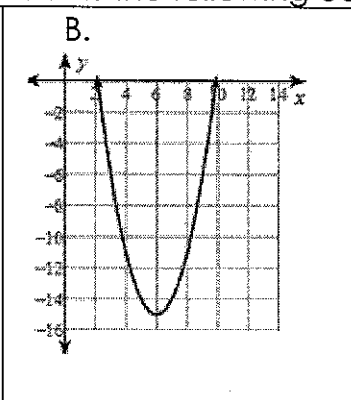
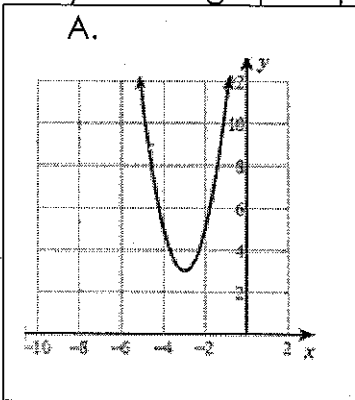
2) Which graph represents the following equation? $f(x) = (x + 2)^2 - 4$

$(-2, -4)$



3) Which graph represents the following equation $y = x^2 - 4x + 1$

$\frac{4}{2(1)} = 2$



Describe the transformations of the following equations

4) $f(x) = -6(x + 2)^2 - 2$

REFLECTION
STRETCH OF 6
LEFT 2
DOWN 2

5) $f(x) = (x - 3)^2 + 5$

RIGHT 3
UP 5

Convert the following into vertex form

<p>6) $x^2 - 2x - 1 = 0$</p> <p>$\frac{b}{2a} = \frac{-2}{2} = -1$</p> <p>vertex $(1, -2)$</p> <p>plug in to find y $(1)^2 - 2(1) - 1 = -2$</p> <p>$y = (x - 1)^2 - 2$</p>	<p>7) $x^2 - 8x - 51 = 0$</p> <p>$\frac{b}{2a} = \frac{-8}{2} = -4$</p> <p>$(4)^2 - 8(4) - 51$</p> <p>$y = (x - 4)^2 - 67$</p>
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Convert the following into standard form

<p>8) $y = 2(x - 4)^2 + 1$</p> <p>$2(x - 4)(x - 4) + 1$</p> <p>$2(x^2 - 4x - 4x + 16) + 1$</p> <p>$2x^2 - 8x - 8x + 32 + 1$</p> <p>$2x^2 - 16x + 33$</p>	<p>9) $y = -5(x + 2)^2 - 4$</p> <p>$-5(x + 2)(x + 2) - 4$</p> <p>$-5(x^2 + 2x + 2x + 4) - 4$</p> <p>$-5x^2 - 10x - 10x - 20 - 4$</p> <p>$-5x^2 - 20x - 24$</p>
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Determine the discriminant and the number of solutions

<p>10) $-2x^2 - 9x - 9 = 0$</p> <p>$(-9)^2 - 4(-2)(-9)$</p> <p>9 so 2 real solutions</p>	<p>11) $-9x^2 - 6x - 1 = 0$</p> <p>$(-6)^2 - 4(-9)(-1)$</p> <p>0 so 1 real solution</p>
<p>12) $5x^2 - 6x + 5 = 0$</p> <p>$(-6)^2 - 4(5)(5)$</p> <p>-64 so no real solutions</p>	<p>13) $x^2 - 5x + 1 = 0$</p> <p>$(-5)^2 - 4(1)(1)$</p> <p>21 so 2 real solutions</p>

Solve the following:

<p>14) $x^2 + x - 56 = 0$</p> <p>$a = 1$ $b = 1$ $c = -56$</p> <p>$\frac{-1 \pm \sqrt{(1)^2 - 4(1)(-56)}}{2(1)}$</p> <p>$\frac{-1 \pm \sqrt{225}}{2}$</p> <p>$\frac{-1 \pm 15}{2} \rightarrow \frac{-1 + 15}{2} = 7$</p> <p>$\frac{-1 \pm 15}{2} \rightarrow \frac{-1 - 15}{2} = -8$</p>	<p>15) $7x^2 + 8x - 12 = 0$</p> <p>$a = 7$ $b = 8$ $c = -12$</p> <p>$\frac{-8 \pm \sqrt{(8)^2 - 4(7)(-12)}}{2(7)}$</p> <p>$\frac{-8 \pm \sqrt{400}}{14}$</p> <p>$\frac{-8 \pm 20}{14} \rightarrow \frac{-8 + 20}{14} = \frac{6}{7}$</p> <p>$\frac{-8 \pm 20}{14} \rightarrow \frac{-8 - 20}{14} = -2$</p>
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$$16) 25x^2 - 49 = 0$$

$$a=25 \quad b=0 \quad c=-49$$

$$\frac{0 \pm \sqrt{(0)^2 - 4(25)(-49)}}{2(25)}$$

$$\frac{0 \pm \sqrt{4900}}{50}$$

$$\frac{0 \pm 70}{50}$$

$$\begin{aligned} \rightarrow \frac{0+70}{50} &= \left(\frac{7}{5}\right) \\ \rightarrow \frac{0-70}{50} &= \left(-\frac{7}{5}\right) \end{aligned}$$

$$17) 9x^2 - 8x = -12$$

$$+12 \quad +12$$

$$9x^2 - 8x + 12 = 0$$

$$a=9 \quad b=-8 \quad c=12$$

$$\frac{8 \pm \sqrt{(-8)^2 - 4(9)(12)}}{2(9)}$$

$$\frac{8 \pm \sqrt{-368}}{18}$$

NEGATIVE DISCRIMINANT

NO REAL SOLUTIONS

$$18) 7x^2 + 12x = -1$$

$$+1 \quad +1$$

$$a=7 \quad b=12 \quad c=1$$

$$\frac{-12 \pm \sqrt{(12)^2 - 4(7)(1)}}{2(7)}$$

$$\frac{-12 \pm \sqrt{116}}{14}$$

$$\frac{-12 \pm 2\sqrt{29}}{14}$$

$$\text{Simplify} = \frac{-6 \pm \sqrt{29}}{7}$$

$$19) x^2 - 8 = -2x$$

$$+2x \quad +2x$$

$$x^2 + 2x - 8$$

$$a=1 \quad b=2 \quad c=-8$$

$$\frac{-2 \pm \sqrt{(2)^2 - 4(1)(-8)}}{2(1)}$$

$$\frac{-2 \pm \sqrt{36}}{2}$$

$$\frac{-2 \pm 6}{2}$$

$$\rightarrow \frac{-2+6}{2} = (2)$$

$$\rightarrow \frac{-2-6}{2} = (-4)$$

20) Graph the following and analyze the characteristics

$$y = (x-1)^2 - 1$$

Vertex: $(1, 1)$

Axis of Symmetry: $x=1$

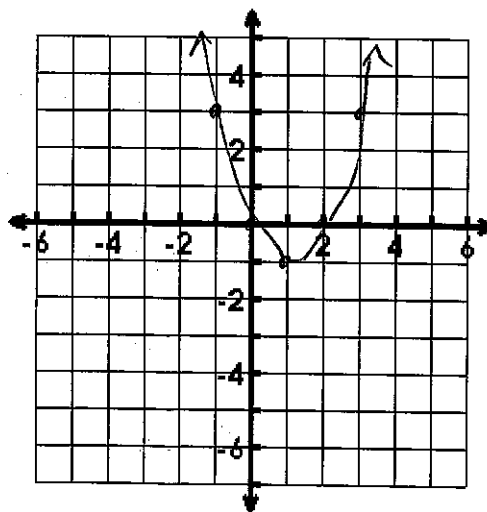
Zeros: $(0, 0)$ $(2, 0)$

Y-Intercept: $(0, 0)$

Interval of Increase: $(1, \infty)$

Interval of Decrease: $(-\infty, 1)$

x	y
-1	3
0	0
1	-1
2	0
3	3



21) Jackson stands at the top of the bleachers at his school. He throws a basketball from the top of the standards and it models the function $h(t) = -16t^2 + 96t + 160$ where h is the height above the ground in feet and t is the time in seconds since the Jackson threw the ball.

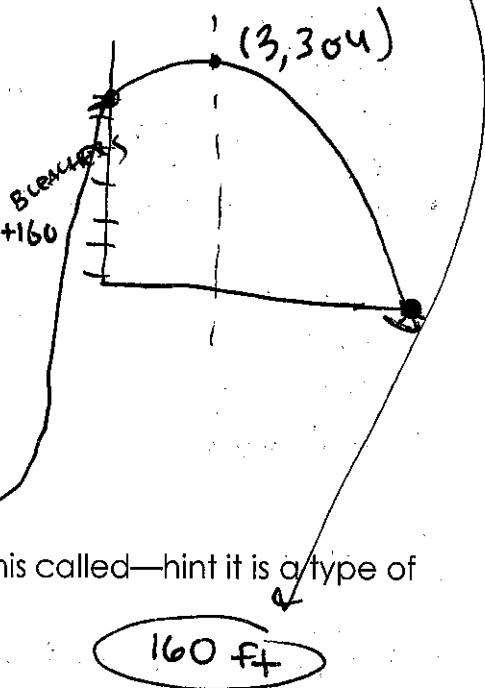
a. Find the time the object changes direction.

$$\frac{-96}{2(-16)} = 3 \quad \text{3 SECONDS}$$

PLUG IN TO FIND VERTEX $-16(3)^2 + 96(3) + 160$

b. Find the maximum height of the object.

$$304 \text{ ft} \quad \text{FROM VERTEX}$$



c. How high the object thrown from? (what is this called—hint it is a type of intercept) ~~BY~~ THE Y-INTERCEPT 160 ft

d. How long did it take for the object to hit the ground? Estimate to one decimal place ZEROS!! QUADRATIC FORMULA

$$a = -16 \quad b = 96 \quad c = 160$$

$$\frac{-96 \pm \sqrt{(96)^2 - 4(-16)(160)}}{2(-16)}$$

$$\frac{-96 \pm \sqrt{19456}}{-32}$$

$$\underline{-96 \pm 139.5}$$