Name: _____ Date: _____ Hour: ____Alg 1____

Unit 7C Day 34: Review Intercept Form of Quadratics and Factoring

Focus Question: Do I remember intercept form and how to create it?

A. Intercept form

Use the following quadratic

$$j(x) = -\frac{4}{3}(x+4)(x-2)$$

1. Solve the function.

$0 = -\frac{4}{3}(x+4)(x-2)$

$x+4=0$ or $x-2=0$

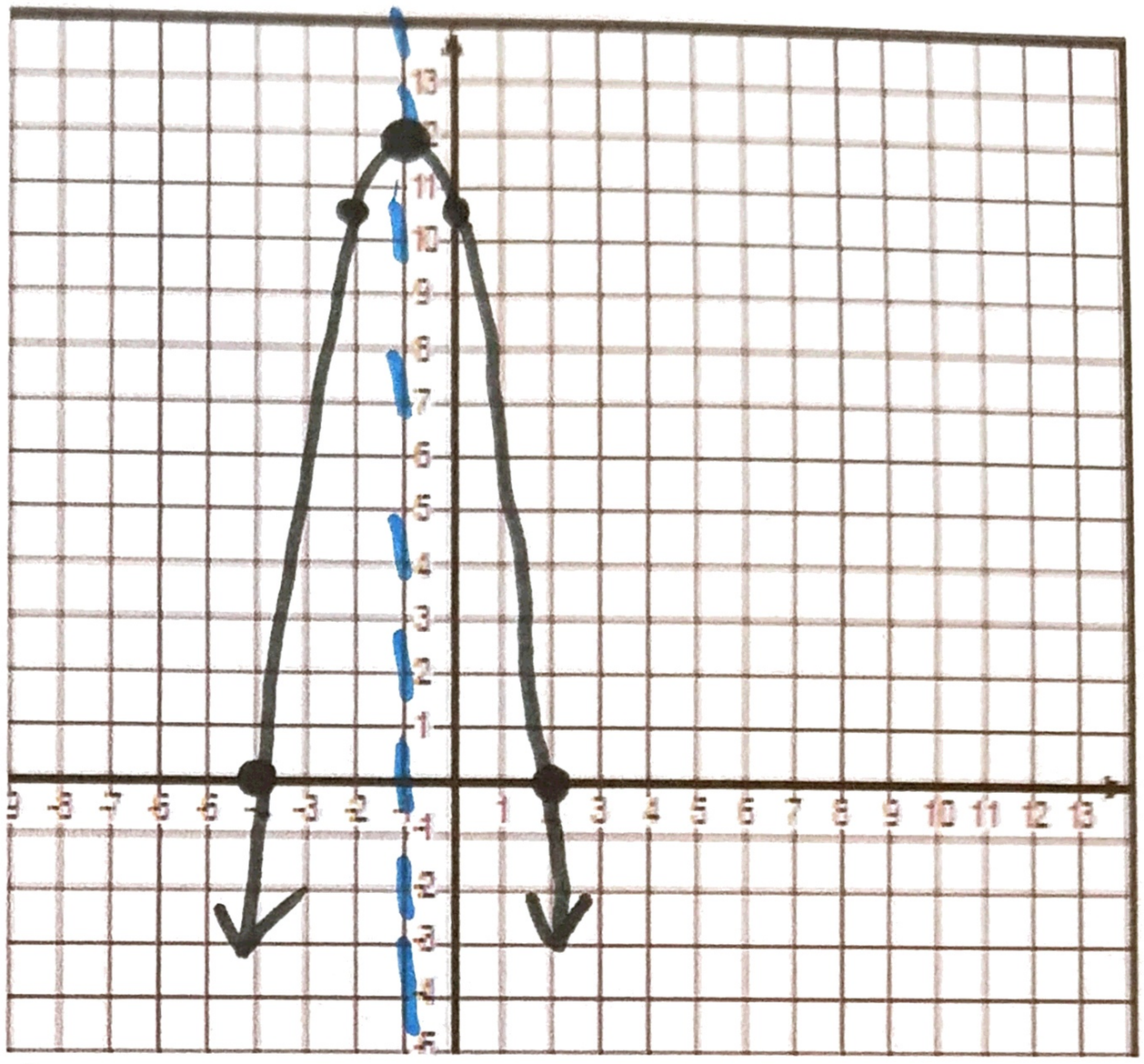
$-4\ -4$ $\quad +2\ +2$

$x=-4$ $\quad x=2$

2. Find the axis of symmetry.

$x=\frac{p+q}{2}$ $\quad x=\frac{-4+2}{2}$

$x=\frac{-2}{2}$ $\quad x=-1$



3. Find its vertex

$j(x) = -\frac{4}{3}(-1+4)(-1-2)$

$= -\frac{4}{3}(3)(-3)$ $\quad = 12$ $\quad (-1, 12)$

$j(0) = -\frac{4}{3}(0+4)(0-2)$

$= -\frac{4}{3}(4)(-2)$

$= -\frac{4}{3}(-8)$

4. Is the vertex a max or min? MAX

5. Find the y-intercept. $x=0$ $\quad (0, 32/3)$

6. Give its domain $(-\infty, \infty)$

7. Give its range $(-\infty, 12]$

8. Jackie threw a ball straight up in the air. The height of the ball in meters, h, at any time in seconds, t, can be modeled by the function $h(t) = -(5t + 1)(t - 3)$

a. When did the ball hit the ground? Show all work. 3 sec.

$0 = -(5t+1)(t-3)$

$5t+1=0$ or $t-3=0$

$t=-\frac{1}{5}$ neg time! $\quad t=3$

b. What was the highest the ball went? Show all work.

$h(\frac{7}{5}) = -(5\cdot\frac{7}{5}+1)(\frac{7}{5}-3)$

$= -(7+1)(\frac{7}{5}-\frac{15}{5})$

$= -(8)(-\frac{8}{5})$

y part of vertex $\quad \frac{64}{5}$ m

$x=\frac{-1/5+3}{2}$ $\quad x=(\frac{-1}{5}+\frac{15}{5})\cdot\frac{1}{2}$

$x=(\frac{14}{5})\cdot\frac{1}{2}$ $\quad x=\frac{14}{10}$

$x=\frac{7}{5}$

c. Find h(0). What does this point represent?

height when he threw the ball

$h(0) = -(5(0)+1)(0-3)$

$= -(1)(-3)$

3 ft

-5-8

Factor each of the following:

$n^2 + 4n - 12$

$n^2+6n-2n-12$

$n(n+6)-2(n+6)$

$(n+6)(n-2)$

$b^2 + 16b + 64$

perf sq. tri.

$(b+8)^2$

$k^2 - 13k + 40$

$K^2-5k-8k+40$

$K(k-5)-8(k-5)$

$(k-5)(k-8)$

$2k^2 + 22k + 60$

$2(k^2+11k+30)$

$2(k^2+5k+6k+30)$

$2(k(k+5)+6(k+5))$

$2(k+5)(k+6)$

$5v^2 - 30v + 40$

$5(v^2-6v+8)$

$5(v-2)(v-4)$

$5n^2 + 19n + 12$

$5n^2+4n+15n+12$

$n(5n)+n(4)+3(5n)+3(4)$

$n(5n+4)+3(5n+4)$

$(5n+4)(n+3)$

$6n^2 + 5n - 6$

$6n^2+9n-4n-6$

$3n(2n)+3n(3)-2(2n)-2(3)$

$3n(2n+3)-2(2n+3)$

$(2n+3)(3n-2)$

$4x^2 + 20x$

$4x(x)+4x(5)$

$4x(x+5)$

$25x^2 - 49$

$(5x)^2-(7)^2$

$(5x-7)(5x+7)$

Solve each of the following. (hint: remember not all quadratics factor!)

$f(x) = x^2 - 5x - 84$

$x=12$, $x=-7$

$g(x) = 5x^2 - 20x$

$x=0$, $x=4$

$h(x) = 6x^2 - 72x - 96$

$x = 6 \pm 2\sqrt{13}$

$x \approx 13.21$, $x \approx -1.21$

1. Cal Ripken hit a pop up above home plate. The height of the ball, h, in feet is related to time, t, in seconds described by the function $h(t) = -16t^2 + 64t + 2$. How long does an infielder have to get under the ball before it hits the ground?

4.03 sec.

2. A square field has 3 meters added to its width and 2 meters added to its length. The new field has an area of $90m^2$. Find the length of a side of the original field.

7 meters

Algebra II: Simplify the following $\frac{6x^2+12x+6}{x^2-1}$

$\frac{6(x+1)}{x-1}$

f(x)

$0 = x^2 - 5x - 84$ $= 84$

1·84
2·48
7·12

$-12 + 7$

$0 = x^2 - 12x + 7x - 84$

$0 = x(x-12) + 7(x-12)$

$0 = (x-12)(x+7)$

$x - 12 = 0$ $\quad x + 7 = 0$

$+12 \quad +12$ $\quad -7 \quad -7$

$\boxed{x = 12}$ $\quad \boxed{x = -7}$

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g(x)

$0 = 5x^2 - 20x$

$0 = 5x(x-4)$

$\boxed{x = 0}$ or $x - 4 = 0$

$+4 \quad +4$

$\boxed{x = 4}$

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h(x)

$\frac{0}{6} = \frac{6x^2}{6} - \frac{72x}{6} - \frac{96}{6}$

$0 = x^2 - 12x - 16$

~~16~~
1·~~16~~
~~2·8~~
~~4·4~~

$b^2 - 4ac$

$(-12)^2 - 4(1)(-16)$

$144 + 64$

$\sqrt{208}$

$\sqrt{16 \cdot 13}$

$x = \frac{12 \pm \sqrt{208}}{2(1)} \Rightarrow \frac{12 \pm 4\sqrt{13}}{2}$

$\boxed{x = 6 \pm 2\sqrt{13}}$

$x = 6 + 2\sqrt{13} \approx 13.21$

$x = 6 - 2\sqrt{13} \approx -1.21$

① Carlipken

$$\frac{0}{-2} = \frac{-16t^2}{-2} + \frac{64t}{-2} + \frac{2}{-2}$$

$$0 = 8t^2 - 32t - 1$$

$+1 \qquad +1$

$$1 = 8t^2 - 32t$$

$+32 \qquad +1 = 8(t^2 - 4t + 4)$

$$\frac{33}{8} = \frac{8(t-2)^2}{8}$$

$$\sqrt{\frac{33}{8}} = \sqrt{(t-2)^2}$$

$$t - 2 = \pm\sqrt{\frac{33}{8}}$$

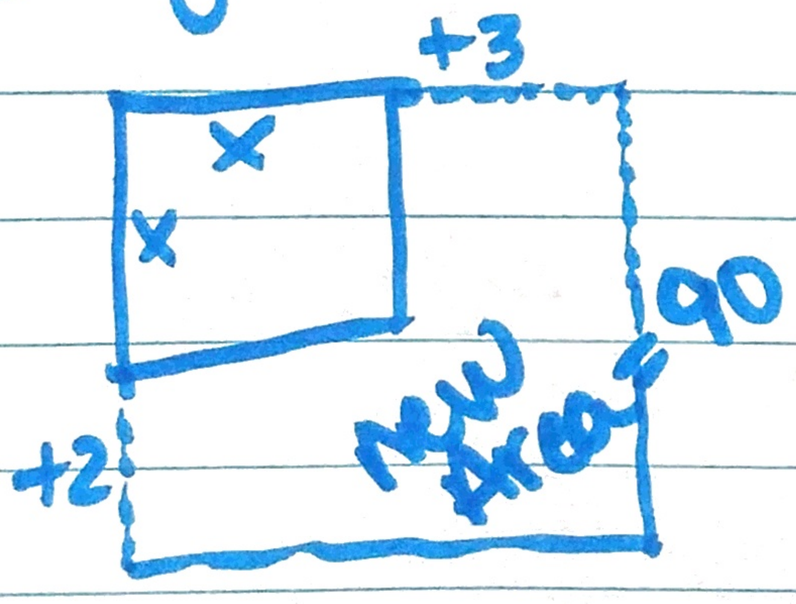
$+2 \qquad +2$

$t \approx 4.03$

$t = 2 + \sqrt{33/8}$ $\qquad t = 2 - \sqrt{33/8}$ neg time

$8 = 1 \cdot 8 = 2 \cdot 4$

② Square Field



$A = lw$

$90 = (x+2)(x+3)$

$90 = x(x+3) + 2(x+3)$

$90 = x^2 + 3x + 2x + 6$

$90 = x^2 + 5x + 6$

$-90 \qquad -90$

$0 = x^2 + 5x - 84$

$0 = x^2 + 12x - 7x - 84$

$0 = x(x+12) - 7(x+12)$

$0 = (x+12)(x-7)$

$x + 12 = 0 \qquad x - 7 = 0$

$x = -12 \qquad x = 7$

Length can't be neg.

$84 = 1 \cdot 84 \downarrow 7 \cdot 12$

Alg II

$$\frac{6x^2+12x+6}{x^2-1}$$

$$\frac{6(x+1)(x+1)}{(x-1)(x+1)}$$

$$\frac{6(x+1)}{x-1}$$

$$x^2-1$$
$$x^2-1^2$$
$$(x-1)(x+1)$$

$$6x^2+12x+6$$
$$6(x^2+2x+1)$$
$$6(x+1)^2$$