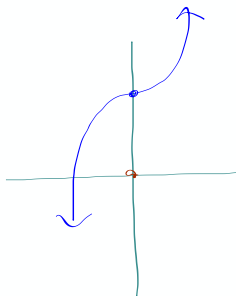1

HW
Tally ⇒

2   Pick up the Warm Up
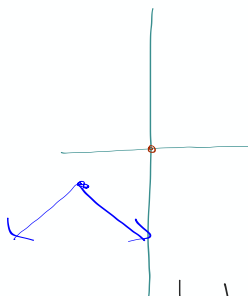
Skip part 2b
for each of
the three functions

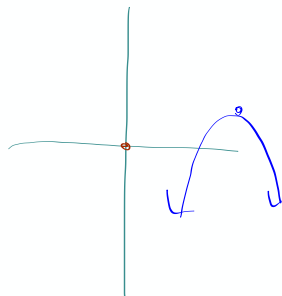$y = x^3 + 5$ $y = -|x+2| - 1$ $y = -(x-5)^2 + 2$

$y = x^3$ $y = |x|$ $y = x^2$

Parents

3. Find the *x*- and *y*-intercepts for the following parabolas

     a. $y = (x + 12)^2 - 144$

$(x+12)^2 - 144 = 0$

$\sqrt{(x+12)^2} = \sqrt{144}$

y-int — Set x = 0

X-int — Set y = 0

$y = (0+12)^2 - 144$

$= 12^2 - 144$

$144 - 144$

0

$(0, 0)$

$x + 12 = \pm 12$

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

$x + 12 = -12$
$\quad -12 \quad -12$
$x = -24$

$(0, 0)$ $(-24, 0)$

$y = (x-8)^2 - 5$

$(x-8)^2 - 5 = 0$

$\sqrt{(x-8)^2} = \sqrt{5}$

$x - 8 = \pm\sqrt{5}$
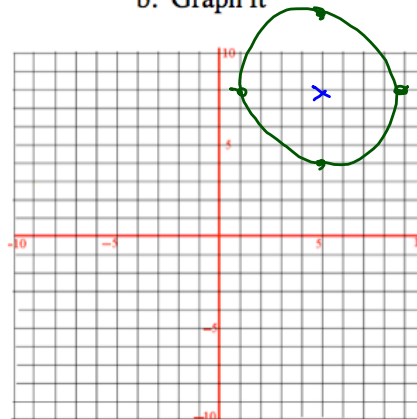
$x = 8 \pm \sqrt{5}$

$(8 + \sqrt{5}, \ 0)$

$(8 - \sqrt{5}, \ 0)$

4. Consider the equation $(x - 5)^2 + (y - 8)^2 = 16$. What can you tell about the graph just by looking at the equation?

   a. It's a ___**Circle**___

   with a center ___**(5,8)**___

   and radius is ___**4**___

   b. Graph it

HW Questions

128a

$y = 7 + 2x^2 + 4x - 5$

$y = 2x^2 + 4x + 2$

X-intercept

set y=0

y-int (set x=0)

$y = 2$

$2x^2 + 4x + 2 = 0$

$x^2 + 2x + 1 = 0$

129

$3y - 4x = -1$

$9y + 2x = 4$ 2

$3y - 4x = -1$

$18y + 4x = 8$

─────────

$21y = 7$

$y = \frac{7}{21} = \frac{1}{3}$

2-127   (2,3) vertex   (0,0)

$$y = a(x-h)^2 + k$$

so one possibility would be

$$y = (x-2)^2 + 3$$

other possibilities $y = 2(x-2)^2 + 3$, $y = \frac{-3}{4}(x-2)^2 + 3$

129   $3y - 4x = {}^-1$ → $3y - 4x = {}^-1$

$9y + 2x = 4$ → $\underline{+\ 18y + 4x = 8}$

129	$3y - 4x = -1$	$21y = 7$

$$2(9y) + 2(2x) = (4)^2$$

$$y = \frac{7}{21} = \boxed{\frac{1}{3}}$$

$$3y - 4x = -1$$
$$+ 18y + 4x = 8$$
_____

$$3\left(\frac{1}{3}\right) - 4x = -1$$

$$1 - 4x = -1$$

$$-1 \qquad -1$$

$$-4x = -2$$

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

2-128	a)	$y = 7 + 2x^2 + 4x - 5$	→ y-intercept $f(0) =$

$$y = 2x^2 + 4x + 2 \qquad (0, 2)$$

X-intercepts $\quad 0 = 2x^2 + 4x + 2$

$$0 = 2(x^2 + 2x + 1)$$

Can factor or use quadratic formula

$$0 = 2(\quad)(\quad)$$

$$0 = 2(x + 1)(x + 1)$$

	x	1
x	x^2	x
1	x	1

$\frac{x^2}{2x}$

$$\downarrow \text{ Z.P.P. } \downarrow$$

$$x + 1 = 0 \qquad x + 1 = 0$$

$$x = -1 \longrightarrow \quad \overset{only}{x\text{-intercept is }} (-1, 0) \longleftarrow$$

this must also be the vertex

graphing form $\quad y = 2(x + 1)^2 + 0$

a) $y = 7 + 2x^2 + 4x - 5$

$y = 2x^2 + 4x + 2$ ⟶ y-intercept $f(0) =$

$(0, 2)$

x-intercepts $0 = 2x^2 + 4x + 2$

Can factor or use quadratic formula

$0 = 2(x^2 + 2x + 1)$

$0 = 2(\quad)(\quad)$

$0 = 2(x+1)(x+1)$

Z.P.P.

$x + 1 = 0 \qquad x + 1 = 0$

only

$x = -1 \longrightarrow$ x-intercept is $(-1, 0)$ ⟵

this must also be the vertex

raphing form $y = 2(x+1)^2 + 0$

2-129 $\dfrac{3y - 4x = -1}{9y + 2x = 4}$

b) $3y - 4x = -1$

$2(9y) + (2x) = (4)$

a) both linear so parent of each is: $y = x$ ✓

$3y - 4x = -1$
$+ \quad 18y + 4x = 8$

$21y = 7$

so $y = \dfrac{7}{21} = \dfrac{1}{3}$

$3y - 4x = -1 \qquad 3(\tfrac{1}{3}) - 4x = -1$

$1 - 4x = -1$

$-4x = -2$

$x = \dfrac{2}{4} = \dfrac{1}{2}$

$\left(\dfrac{1}{2}, \dfrac{1}{3}\right)$

c) the two graphs must intersect at $\left(\frac{1}{2}, \frac{1}{3}\right)$

d) The solution to the system is the point of intersection of the two lines.

2-130 a) 10, 2.5, .625,

multiplier is $\frac{2.5}{10} = \frac{1}{4}$

$$t(n) = 40(.25)^n$$
or $t(n) = 10(.25)^{n-1}$

b) −2, −8, −14 . . . .

difference is −6

$$t(n) = -6n + 4 \quad \text{or}$$
$$t(n) = -6(n-1) - 2$$

2-131

a) $y = |x-4| - 2$

$y = a|x-h| + k$

↓

Vertex $(4, -2)$

domain $-\infty < x < \infty$

range: $y \geq -2$

(or $-2 \leq y < \infty$)

y-intercept

$y = |0-4| - 2$

$= |-4| - 2$

$= 4 - 2 = 2$

⟹ $(0, 2)$

x-intercept(s)

$0 = |x-4| - 2$

$2 = |x-4|$

reverse

$|x-4| = 2$

$x-4 = 2$ $x-4 = -2$

$x = 6$ and $x = 2$

$(2, 0)$
$(6, 0)$

2-139 $y = x^2 + 7x - 8$

$y + 12.25 =$

x	x²	3.5x
3.5	3.5x	12.25

$- 8$

$y + 12.25 = (x+3.5)^2 - 8$

$y = (x+3.5)^2 - 20.25$

2-146 find
Parabola, vertex $(3,5)$ contains $(0,0)$

2-146 find
Parabola, vertex $(3,5)$ contains $(0,0)$

a)　　　$y = a(x-3)^2 + 5$　　　$0 = a(0-3)^2 + 5$
　　　　　$(0,0)$　　　　　　　$0 = a(-3)^2 + 5$
　　　　　　　　　　　　　　　$0 = 9a + 5$
　　　　　　　　　　　　　　　$a = -\frac{5}{9}$

$$y = a(x-h)^2 + 5$$

2-166 $y = x^2 - 5x + 7$

$y = \boxed{x^2 \;-2.5x} + 7$
$\phantom{y = \boxed{x^2}}{}-2.5x$

$y = x \boxed{\begin{array}{cc} x^2 & -2.5x \\ -2.5x & 6.25 \end{array}} + 7 - 6.25$

$y = (x - 2.5)^2 + .75$ → Vertex $(2.5, 0.75)$

<u>Before</u> the Test Tomorrow
turn in Ch. 2 HW packet
which will include

Ch. 2 Review – Part 1 (handout)

9 assignments → 90

Agenda (to Review)

① Pairs - Modeling Problem

② Ch. 2 Review Part 1
     - hopefully you can finish this in class
     - check your answers
     - Staple in your HW packet

③ Ch. Review - Part 2
     - You won't be turning this in, but
       be smart ..... do it and check answers

---

① Pairs
② One paper
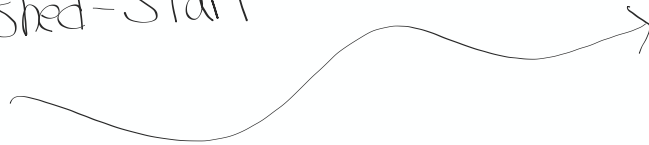③ Rotate who writes
④ Check solution
    with me

✓ label both axes

✓ label all important points
    with their coordinates

(,)

Start

Ch. 2 Review - Part 1

- Check answers as you work
- Attach to flw packet when finished

When finished - Start
Part 2

Ch. 2 Review Part 2

[2]. 147, 170-171, 174-175,
177-179, 181

answers (not solutions) are in your
book for all but 147
I hope to post solutions for
the rest.

Ch. 2 Review - Part I   Name _____ Per. __

① Write a transformation equation, $T(x)$, for each situation

    a) $y = \sqrt{x}$ after it has been translated 2 left, 5 down, and compressed vertically by 0.2   _____

    b) $y = 5^x$ after it has been translated 16 right, 3 down, and stretched vertically by 4.   _____

    c) $y = \frac{1}{x}$ after it has been translated down 100 and 200 up.

② what is the domain of $y = \frac{1}{x-4}$? _____ range _____

③ Factor the quadratic expression (not solve anything. Just factor). $10x^2 + 11x - 6$

④ Triangulum (M33) wants to find the exponential function that passes through the points (2, 75.6) and (6, 97977.6). Assuming that the graph has an asymptote at $y = 0$, what is the equation of the function? *Show all of your work!*

$$y = ab^x \qquad y = ab^x$$

$$75.6 = ab^2 \qquad 97977.6 = ab^6 \longrightarrow 97977.6 = \frac{75.6 \cdot b^6}{b^2}$$
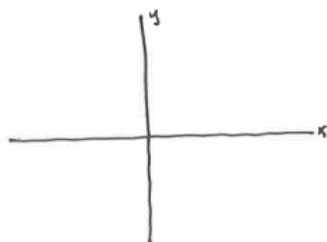
$$a = \frac{75.6}{b^2}$$

$$97977.6 = 75.6 \cdot b^4$$

$$b^4 = \frac{97977.6}{75.6}$$

$$\sqrt[4]{\quad} \qquad \sqrt[4]{\quad}$$

⑤ Convert to graphing form $[y = x^2 + 2x - 15]$
(Practice both methods .... Completing the square and Averaging the x-intercepts by

⑥ Sketch $y = \frac{1}{x+4} + 5$. Then specify any asymptotes and their equations. Use "HA" for horizontal and VA for vertical

⑦　Solve the system of linear equations

$$4x - y = -13$$
$$3x + 2y = 4$$