Warm Up

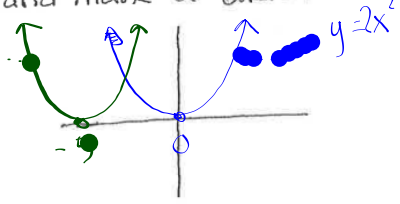
Questions on Homework

Transfor the parabola $y = 2x^2$ so it slides 5 units to the left:

$y = 2(x+5)(x+5)$

$y = 2(x+5)^2$

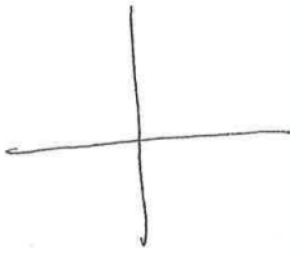
Then graph both simultaneously on your GDC and make a sketch.



Transform the parapola $y = x^2 + 5x + 4$ 8 units to the right.

$y = (x-8)^2 + 5(x-8) + 4$

Graph and make a sketch



$y = (x-8)^2 + 5(x-8) + 4$

1. $4x^2 - 1 =$

2. $x^2 - 9 = (x+3)(x-3)$

3. $36x^2 - 9 = 9(4x^2-1)$ $9(2x+1)(2x-1)$

4. $100x^2 - 81 = (10x+9)(10x-9)$

5. $25x^2 - 4 =$

6. $81x^2 - 121 = (9x+11)(9x-11)$

7. $x^2 - 16 = (x+4)(x-4)$

8. $144x^2 - 16 = 16(9x^2-1) = 16(3x+1)(3x-1)$

Cross out the correct answers below. Use the remaining letters to complete the statement.

$(x+13)(x-13)$ THE	$16(3x-1)(3x-1)$ SUM	$(x-4)(x+4)$ OFA	$(6x+5)(6x-5)$ PRO	$(25-4x)(25+4x)$ QUO	$(x+1)(x-1)$ DUC
$(9+x)(9-x)$ TOF	$9(2x-1)(2x+1)$ TIE	$(x+7)(x-7)$ THE	$(2x+1)(2x-1)$ NTA	$(9x+1)(9x-1)$ SUM	$(x+2)(x-2)$ AND
$(10-x)(10+x)$ WAS	$(5x+3)(5x-3)$ DIE	$(x-5)(x+5)$ HAS	$(8x+1)(8x-1)$ FER	$(11x-7)(11x+7)$ MAN	$(x-6)(x+6)$ NER

7. $x^2 - 16 =$

8. $144x^2 - 16 =$

9. $x^2 - 25 =$

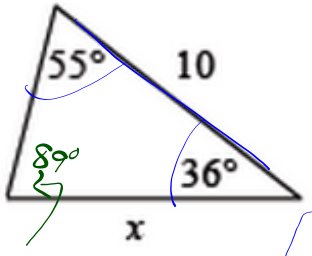
10. $625 - 16x^2 =$

11. $100 - x^2 =$

12. $x^2 - 36 =$

13. $121x^2 - 49 =$

14. $49x^2 - 16 =$



$90° - (55+36)$

$=$

Which one?

~~Pythag Theorem~~

~~SohCahToa~~

Law of Sines

Law of Cosines

ASA

$\frac{\sin(55°)}{x} = \frac{\sin(89°)}{10}$

$x = \frac{10 \cdot \sin(55)}{\sin(89°)}$

$= 8.19$

$$\frac{\sin 55^\circ}{x} = \frac{\sin 89^\circ}{10}$$

$$x \cdot \sin 89^\circ = 10 \cdot \sin 55^\circ$$

$$x = \frac{10 \sin 55^\circ}{\sin 89^\circ} \approx 8.2$$

Questions on HW

2-17 $p(x) = x^2 + 5x - 6$

(a) y-intercept $x = 0$ $(0, -6)$

(b) x-intercept $\rightarrow$ $y = 0$

$0 = x^2 + 5x - 6$

$a = 1$
$b = 5$
$c = -6$

Quadratic Formula

Factor, then use the zero product property

$$x = \frac{-(5) \pm \sqrt{(5)^2 - 4(1)(-6)}}{2(1)}$$

$$= \frac{-5 \pm \sqrt{49}}{2} = \frac{-5 \pm 7}{2}$$

$$x = \frac{-5+7}{2} \quad \frac{2}{2} = 1$$

$$x = \frac{-5-7}{2} = \frac{-12}{2} = -6$$

x-int

$(1, 0)$

$(-6, 0)$

(c) $q(x) = x^2 + 5x$ → y-intercept

(0, 0) ← y-int

x-intercept ($y = 0$)

$0 = x^2 + 5x$

$0 = x(x + 5)$

$x = 0$ or $x + 5 = 0$

$x = -5$

(0, 0)

(-5, 0)

(d) $p(x) - q(x)$

$x^2 + 5x - 6 - [x^2 + 5x]$

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

$= -6$

19 @

(a) $\left(\frac{1}{81}\right)^{-\frac{1}{4}} = \left(\frac{81}{1}\right)^{\frac{1}{4}} = \sqrt{\quad}$

(b) $x^{-2}y^{-4} =$

(c) $(2x)^{-2}(16x^2y)^{\frac{1}{2}}$

(b) $x^{-2} \cdot y^{-4}$

$= \frac{1}{x^2} \cdot \frac{1}{y^4}$

$\frac{1}{x^2y^4}$

19 © $(2x)^{-2}(16x^2y)^{\frac{1}{2}}$

20 First Week (each buy a popcorn + 1 drink)

$3p + 3d = 22.50$ $\quad 3x + 3y = 22.50$

p = price of popcorn

d = price of drink

2nd wk (each by $8 ticket + 1 popcorn + 3 drinks

$3d + 1p + 3(8) = 37.50$

24

$3p + 3d = 22.50$

$p + 3d = 13.50$

$3p + 3d = 22.50$

$-p + 3d = 13.50$

$2p = 9.00$

$p = \$4.50$

21c $(0,5)$ $(5,0)$

$$d = \sqrt{(0-5)^2 + (5-0)^2}$$

$$\sqrt{(-5)^2 + 5^2}$$

$$\sqrt{50} = \sqrt{25}\sqrt{2} = 5\sqrt{2}$$

(18) (a)

$4^z = 8$

$(2^2)^z = 2^3$

$2^{2z} = 2^3$

$2z = 3$

Left exponent = right exponent

$2z = 3$

$z = \frac{3}{2}$

(a) $3p + 3d = 22.50$

$p + 3d + 3(8) = 37.5$

(b)

(b) $4^{\frac{2z}{3}} = 8^{z+2}$

$(2^2)^{\frac{2z}{3}} \quad (2^3)^{z+2}$

$2^{\frac{4z}{3}} = 2^{3(z+2)}$

$\therefore$

(b) $4^{\frac{2z}{3}} = 8^{z+2}$

$(2^2)^{\frac{2z}{3}} \quad (2^3)^{z+2}$

$2^{\frac{4z}{3}} = 2^{3(z+2)}$

exponent on left = exponent on right

$\frac{4z}{3} = 3(z+2)$

$3\left(\frac{4z}{3}\right) = 9(z+2)$

$4z = 9z + 18$

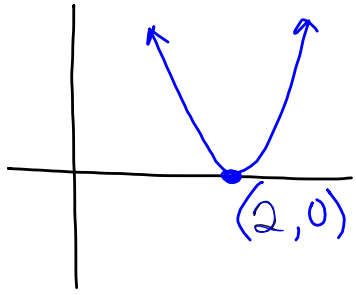
$-9z \quad -9z$

$-5z = 18$

$z = -\frac{18}{5}$

RECAP
From yesterday

$y = (x\ \ )(x\ \ )$?

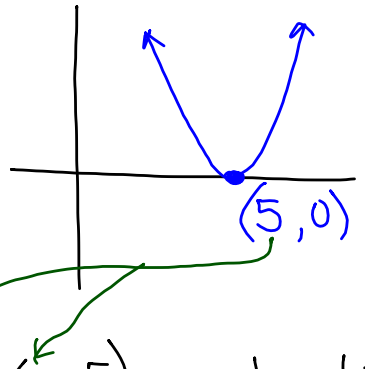


Notes ↘

Why does $y = (x-2)(x-2)$ only touch the x-axis at $x = 2$?

RECAP
From yesterday

$y = (x\ )(x\ )$?



Why does $y = (x-5)(x-5)$ only touch the x-axis at $x = 5$?

Where will $y = (x-8)(x-8)$ touch the x-axis?

$y = (x+2)(x+2)$?

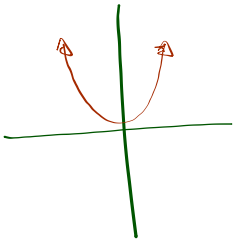
$y = (x-4)^2$

$y = (x+3)(x-1)$

NOTES

$y = 4(x-5)^2$

Determine all of the ways to transform a PARABOLA by changing its equation.

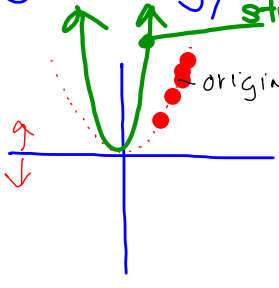


Today's AIM

Terminology

vertically stretched

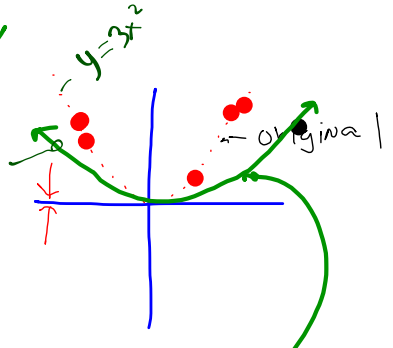
original



Vertical stretch

$y = x^2$

original



Vertical shrink

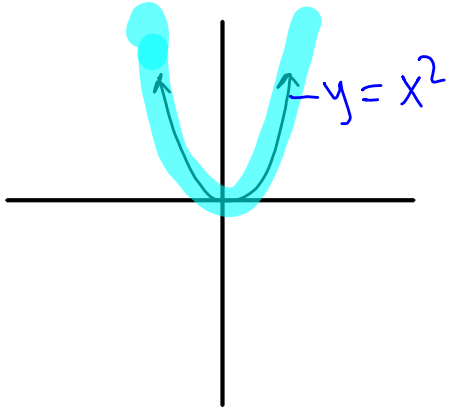
NOTES

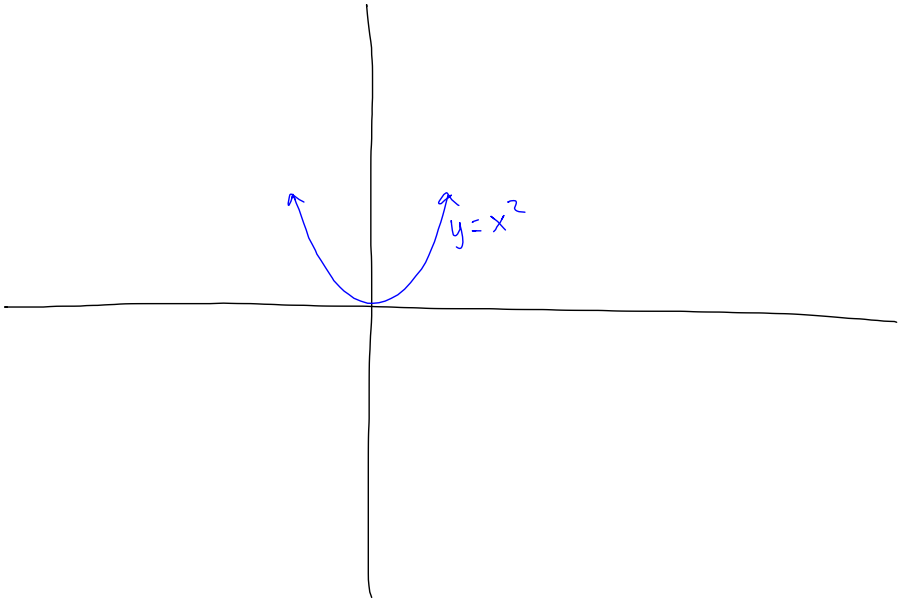
You'll Start with an investigation that will require you to record Transformations

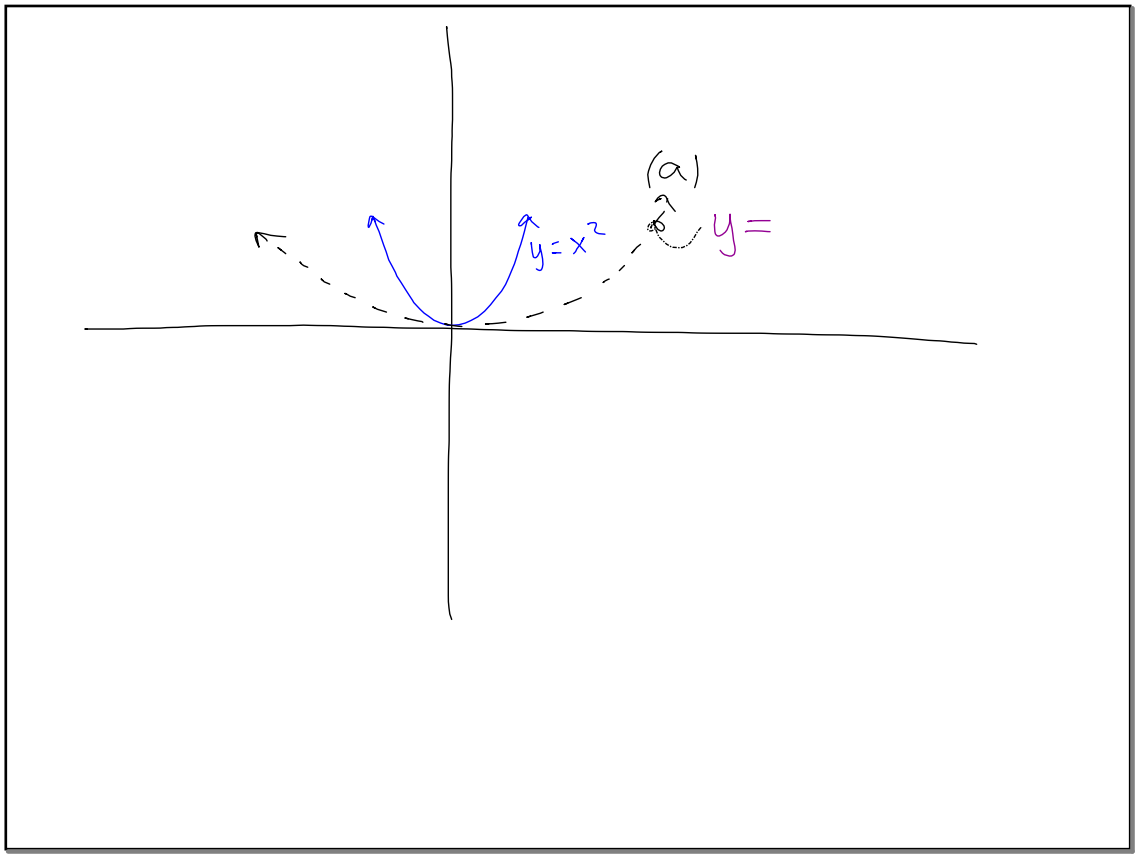
Color the base function

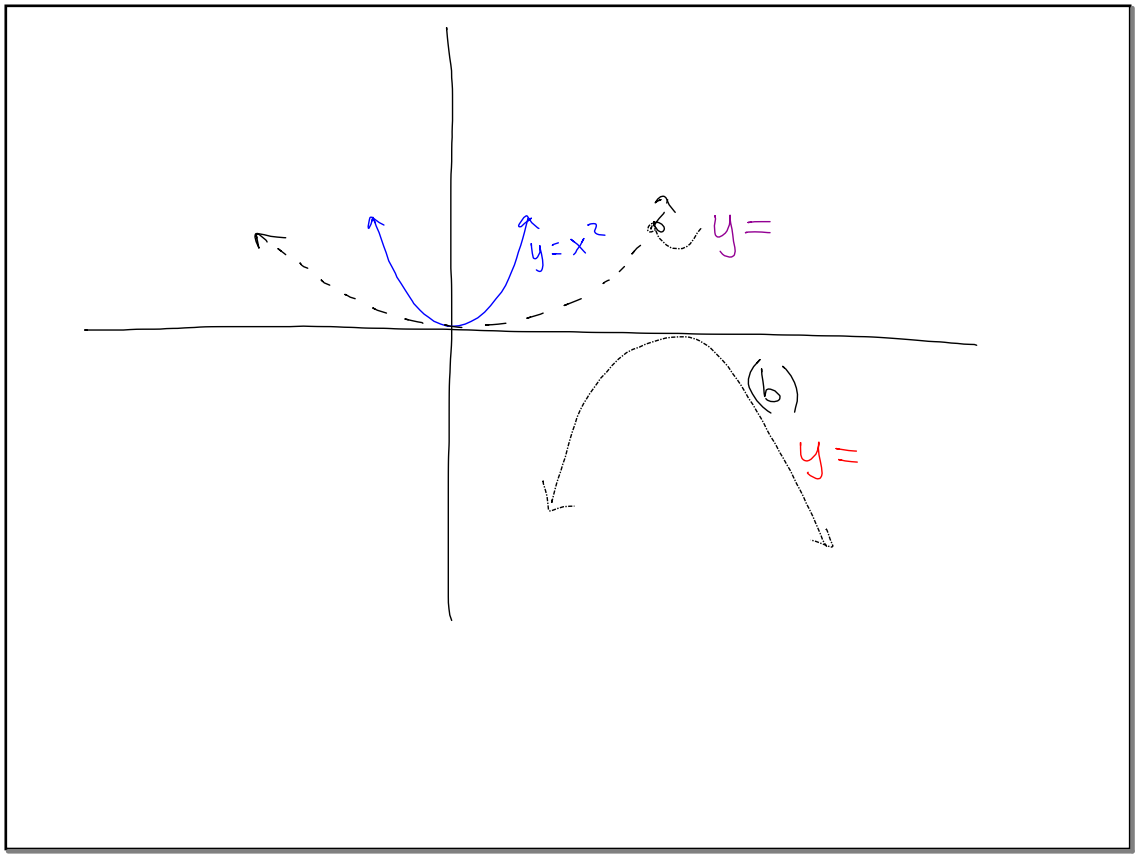
Keep a record

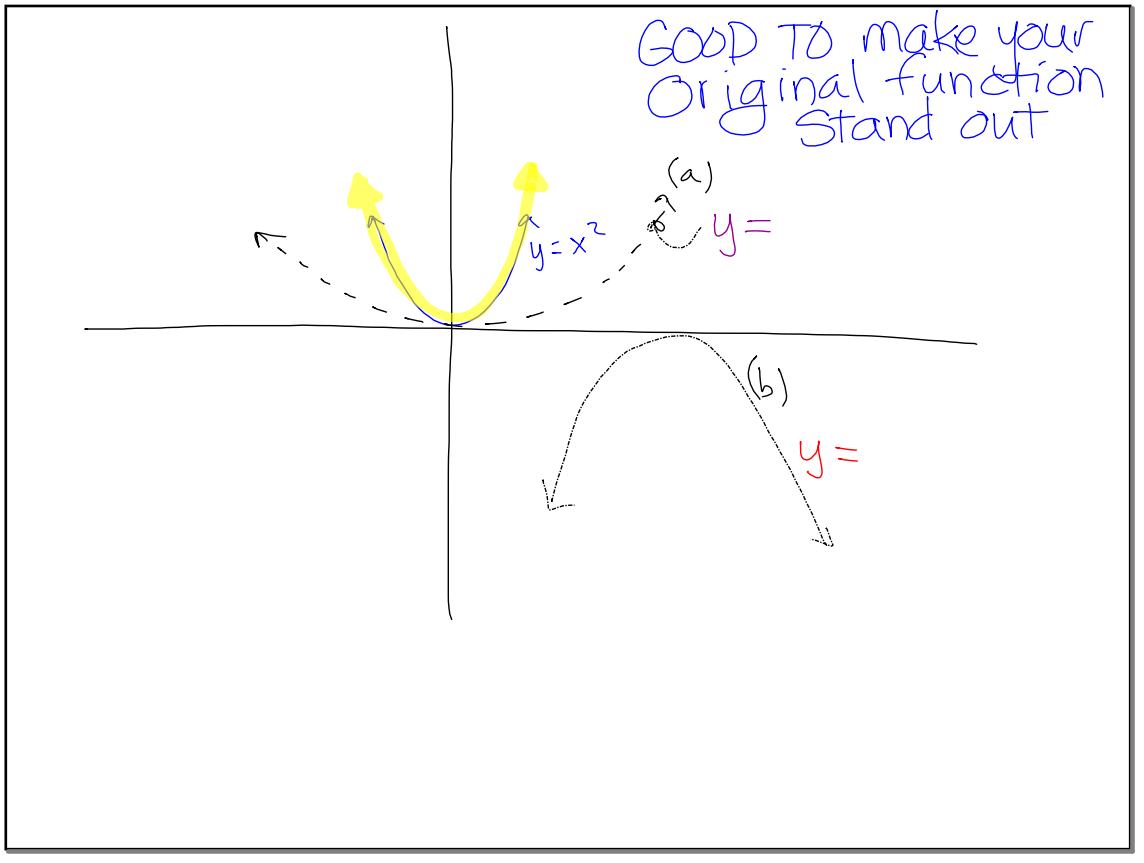
transformations with their equations

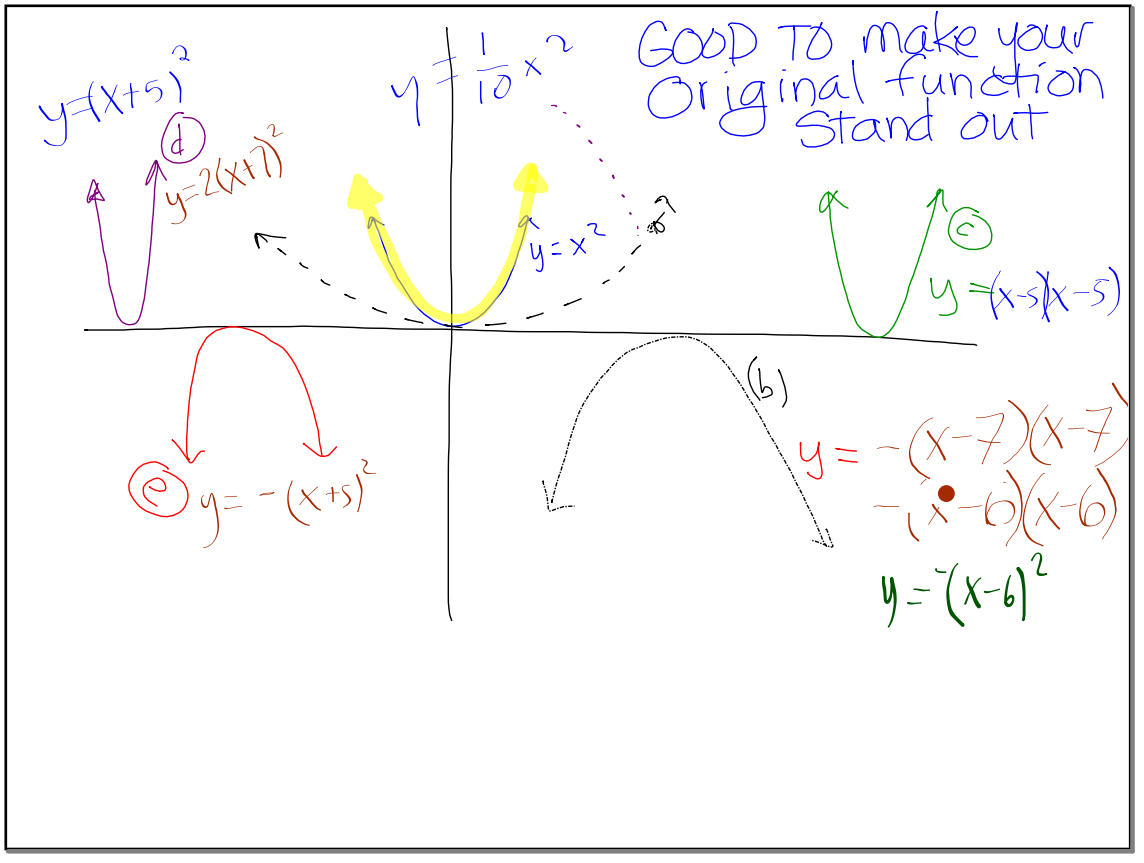





(a)
$y = x^2$
$y =$


$y = x^2$
$y =$
(b)
$y =$


GOOD TO make your Original function Stand out
(a)
y=
y=x²
(b)
y=

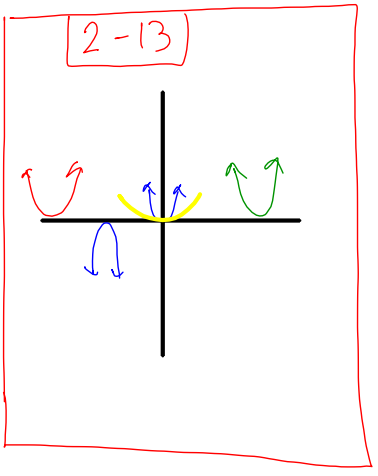

GOOD TO make your Original function Stand out
y=(x+5)²
d
y=2(x+7)²
y=1/10 x²
y=x²
c
y=(x-5)(x-5)
(b)
y=-(x-7)(x-7)
-(x-6)(x-6)
y=-(x-6)²
e
y=-(x+5)²

Try each yourself

↓

then confer

2-13



sketches are fine but keep things proportional

a)

b)

c)

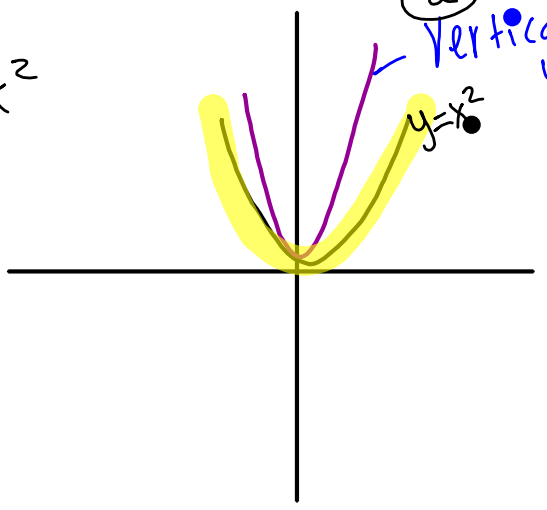
d)

Work through

2-1...13 on page 62

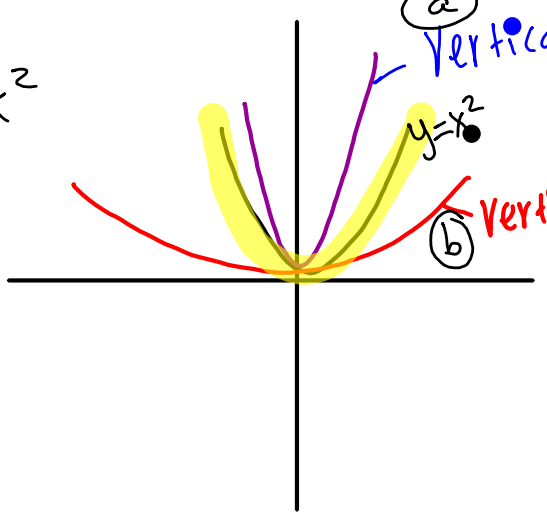
$Y_1 =$

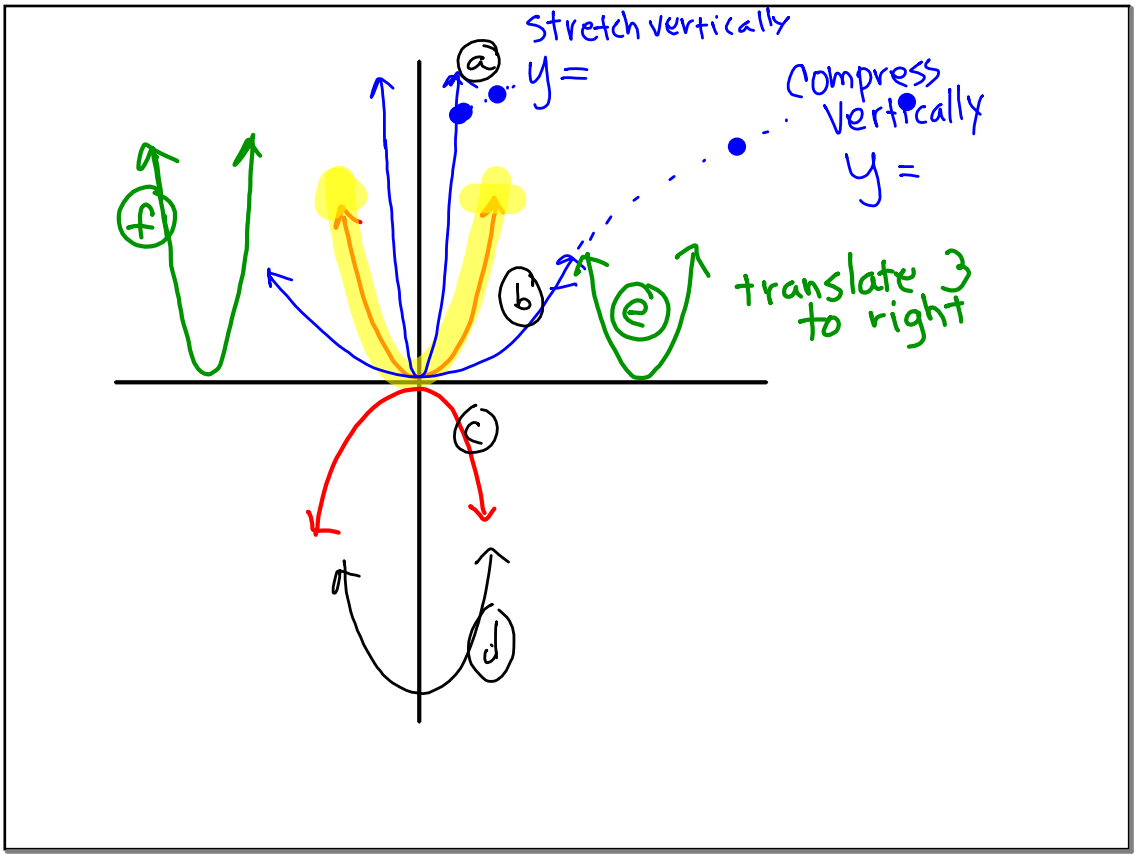
$Y_2 = x^2$



$Y_1 =$

$Y_2 = x^2$

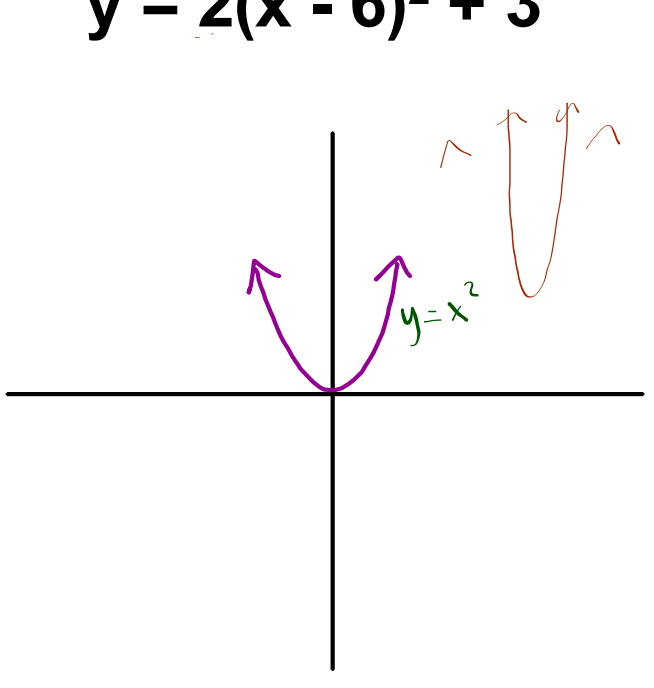



Stretch vertically
a
y =
Compress
Vertically
y =
f
b
e
translate 3
to right
c
d

B.B.

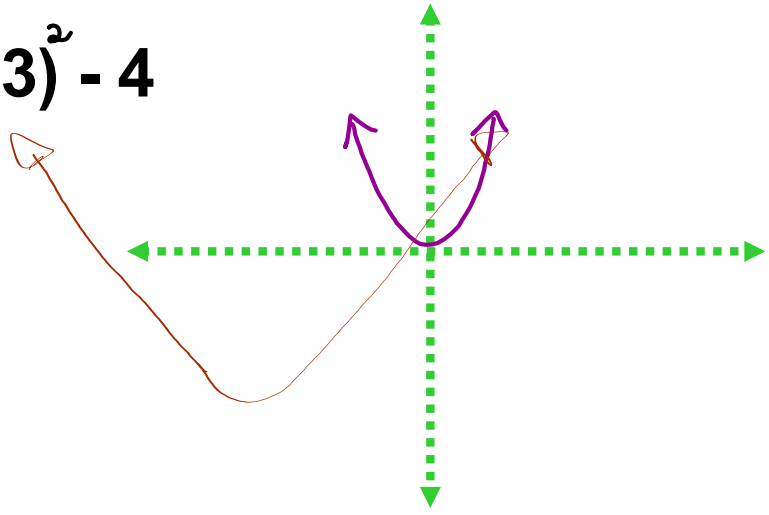
Closure

$y = 2(x - 6)^2 + 3$



Without Using a GDC, sketch the following....

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



Quiz
on Sequences
& Expon. Functions
tomorrow

Turn in HW Packet with 6 assignments.

Assignment

2 - 23 to 27, 28a, 29