

Pick Up the Warm Up

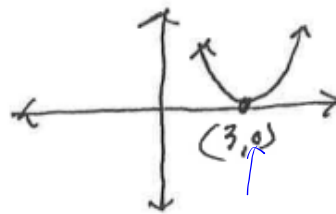
Questions
on
Homework



The quiz on sequences (and exponential functions) will be toward the end of this period.

① why does $y=(x-3)(x-3)$ only touch the x-axis at $x=3$ and no where else?

because 3
is the only
value that will
make $y=0$



- ② Where will $y = (x-8)(x-8)$ touch the x-axis? $(8,0)$
 Where will $y = (x-20)^2$ touch the x-axis? $(20,0)$
 Where will $y = (x+6)^2$ touch the x-axis? $(-6,0)$
 Where will $y = (x-3)(x-1)$ touch the x-axis? $(3,0)$ $(1,0)$

- ③ Transform the parabola $y = 7x^2$ so it slides (translates) 5 units to the right. $7(x-5)^2$
 $y = \underline{7(x-5)^2}$
 what about 9 units left $y = \underline{7(x+9)^2}$ X

- ④ In general, to slide any parabola to the right you replace (x) with $x - \text{something}$.
 ↑
 input

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

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

$$= (x-7)(x-4)$$

(Graph both on your GDC to check)

$$y = (x+1)(x+4)$$

Questions
on HW

(18) a) $(4)^z = 8$

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

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

Left exponent = right exponent

$2z = 3$

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

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

$(16)^{\frac{z}{3}} = 8^{(z+2)}$

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

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

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

$4z = 9(z+2)$

$4z = 9z + 18$

2-17

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

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

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

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

$$\begin{aligned} a &= 1 \\ b &= 5 \\ c &= -6 \end{aligned}$$

Quadratic
Formula

Factor, then
Use the zero
product property

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

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

$$x = \frac{-5+7}{2} = \frac{2}{2} = 1 \quad \frac{x\text{-int}}{(1, 0)}$$

$$x = \frac{-5-7}{2} = \frac{-12}{2} = -6 \quad (-6, 0)$$

(c) $q(x) = x^2 + 5x$ \rightarrow y-intercept

$(0, 0)$

\downarrow
x-intercept (y=0)

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

$$0 = x(x+5)$$

\downarrow
 $x=0$

\downarrow
 $x+5=0$

$x=-5$

$(0, 0)$

$(-5, 0)$

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

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

$$= \cancel{x^2} + \cancel{5x} - 6 - \cancel{x^2} - \cancel{5x}$$

$$- 6$$

$$= -6$$

$$\boxed{19} \text{ a} \quad \left(\frac{1}{81}\right)^{-\frac{1}{4}} = \left(\frac{81}{1}\right)^{\frac{1}{4}} = \sqrt[4]{\quad}$$

$$\text{b} \quad x^{-2} y^{-4} =$$

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

$$\text{b} \quad x^{-2} \cdot y^{-4}$$

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

$$\left(\frac{1}{x^2 y^4}\right)$$

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

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

$$3p + 3d = 22.50$$

2nd wk (each buy \$8 ticket + 1 popcorn + 3 drinks)

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

$$\begin{array}{r} -3p + 8d = 22.50 \rightarrow \\ p + 3d = 13.50 \rightarrow \\ \hline 2p = \end{array} \quad \begin{array}{r} 3p + 3d = 22.50 \\ -3p - 9d = -41.50 \\ \hline -6d = -18 \\ d = 3 \end{array}$$

$$\boxed{21c} \quad (0,5) \quad (5,0)$$

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

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

$$3p + 3d = 22.50$$

$$\textcircled{a} \quad p + 3d + 3(8) = 37.5$$

\textcircled{b}

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

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

exponent on left = exponent on right
 $\frac{4z}{3} = 3(z+2)$
 $3\left(\frac{4z}{3}\right) = 9(z+2)$
 $4z = 9z + 18$
 $-5z = 18$
 $z = -\frac{18}{5}$



NOTES

Determine Other Ways
to transform Parabolas

-

(NOTES)



**Today's
AIM**

Terminology

Vertically stretched

original

Vertical stretch

original

Vertical shrink

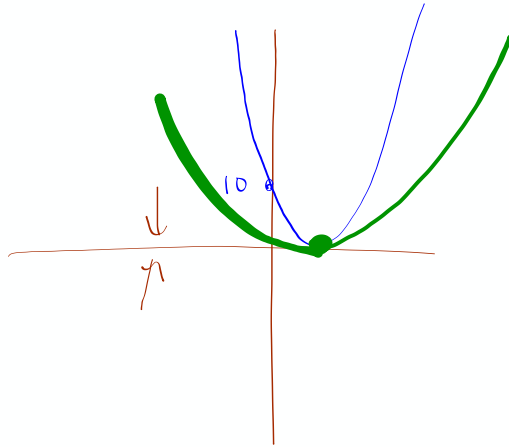
NOTES

$y = 0.25x^2$

The image contains two hand-drawn graphs illustrating vertical transformations of a parabola. The left graph shows a parabola being stretched vertically. A dotted line represents the 'original' parabola, and a solid line represents the 'vertically stretched' parabola. Red dots are on the original curve, and green dots are on the stretched curve. Red arrows indicate the vertical distance between the original and stretched points. The right graph shows a parabola being shrunk vertically. A dotted line represents the 'original' parabola, and a solid line represents the 'vertically shrunk' parabola. Red dots are on the original curve, and green dots are on the shrunk curve. Red arrows indicate the vertical distance between the original and shrunk points. To the right, under the heading 'NOTES', is a graph of the parabola $y = 0.25x^2$.

Vertical shrink

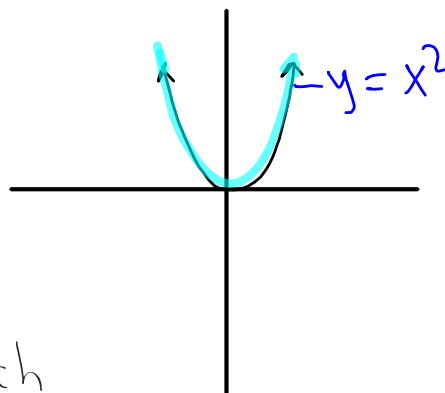
The image shows a hand-drawn graph illustrating vertical shrink. A blue parabola is shown opening upwards. A dotted line represents the original parabola, and a solid blue line represents the vertically shrunk parabola. Red arrows indicate the vertical distance between the original and shrunk points. The text 'Vertical shrink' is written above the graph.

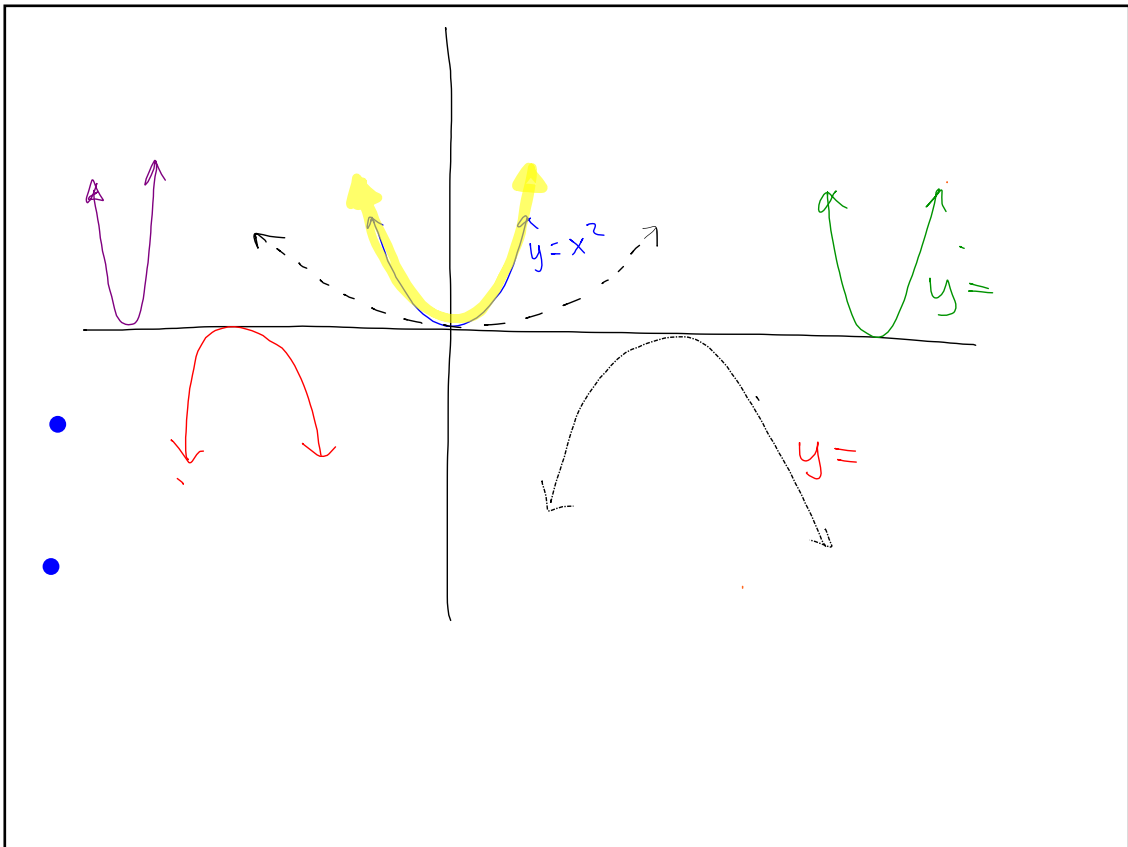
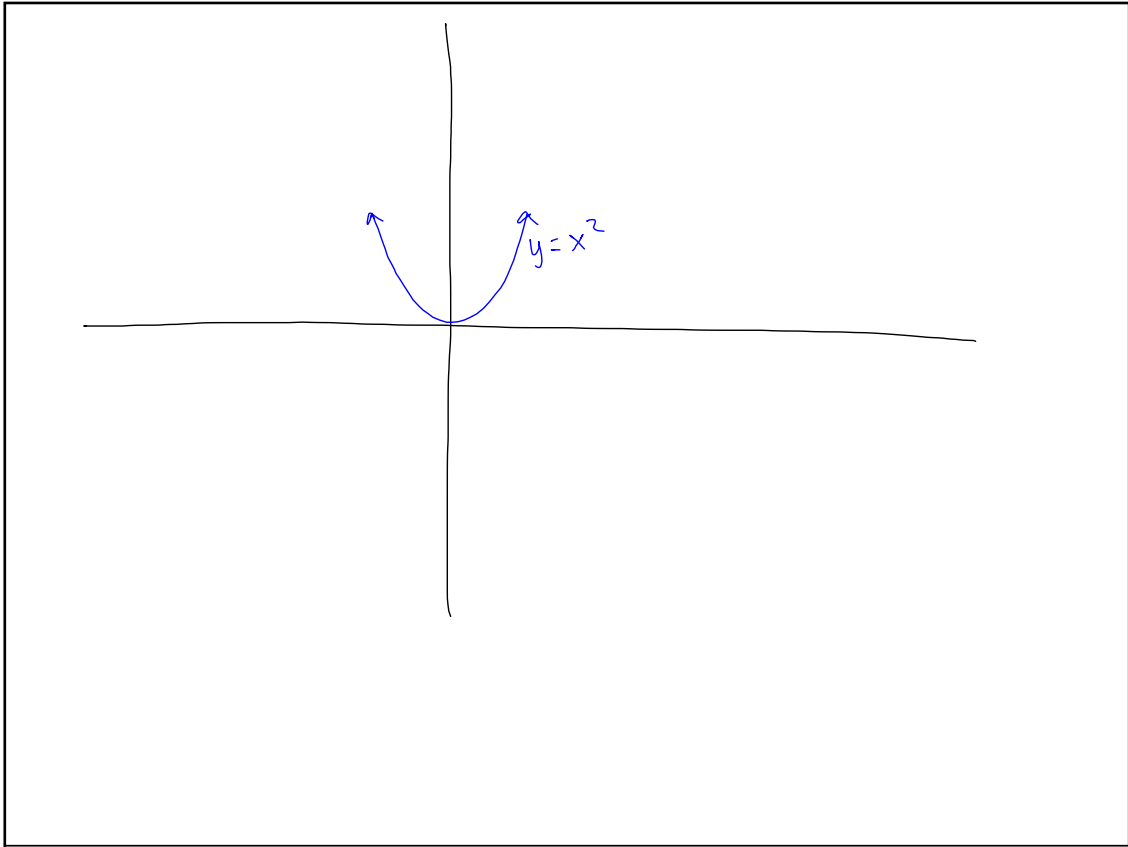


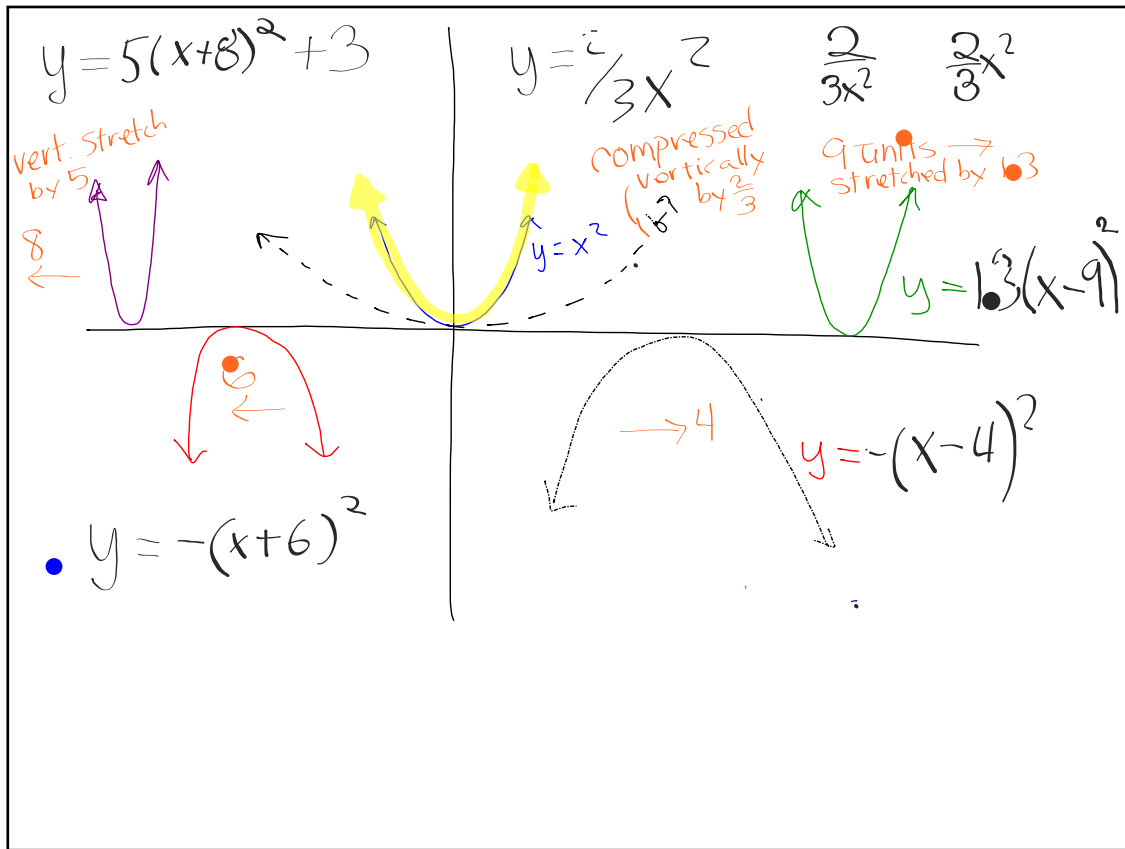
You'll Start with an investigation that will require you to record Transformations

You'll make several transformations of the parent function $y = x^2$

all on the same Large sketch



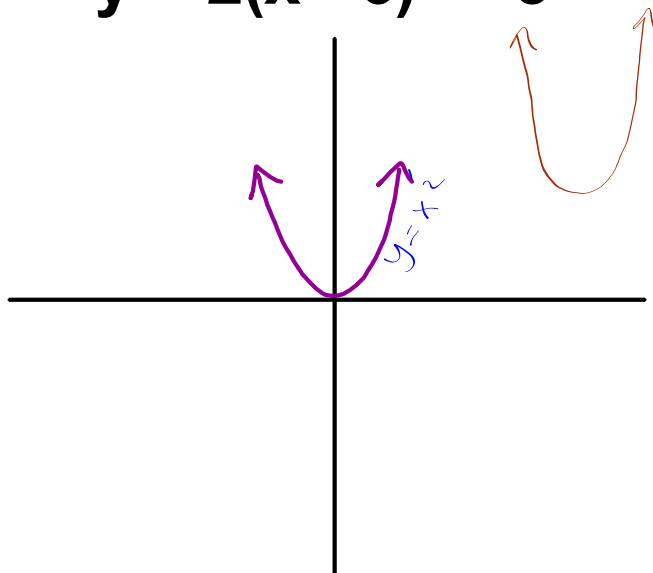




B.B.

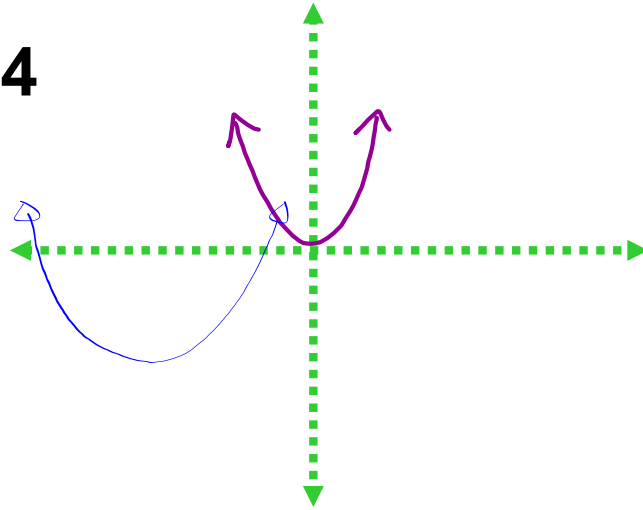
Closure

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



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

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



Quiz
on Sequences
& Expon. Functions

Assignment

2 - 23 to 27, 28a, 29