

09/10/18.

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MATH 2311
Pre-Calculus I
Ms. Palmer

③ endpoints $(2, 2)$ and $(5, -2)$.

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

Center = midpoint $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$.

$$C = (\frac{2+5}{2}, \frac{2+(-2)}{2}) = (3.5, 0).$$

$$\Rightarrow (x-3.5)^2 + y^2 = r^2.$$

Finding r :

$$\begin{aligned} d &= \sqrt{(x_1-x_2)^2 + (y_1-y_2)^2} \\ &= \sqrt{(2-5)^2 + (2-(-2))^2} \\ &= \sqrt{(-3)^2 + (4)^2} = \sqrt{9+16} \\ &= \sqrt{25} = 5. \\ r &= \frac{5}{2} \end{aligned}$$

\Rightarrow Standard form:

$$\begin{aligned} (x-3.5)^2 + y^2 &= (\frac{5}{2})^2 \\ &= (x-3.5)^2 + y^2 = 6.25 \end{aligned}$$

$$\textcircled{1} \quad x^2 + y^2 - 22x + 6y + 129 = 0$$

find center and radius.

$$(x-11)^2 - 121 + (y+3)^2 - 9 + 129 = 0$$

$$(x-11)^2 + (y+3)^2 = 1 \Rightarrow \text{standard form:}$$

$$\text{Center: } (11, -3)$$

$$r = \sqrt{1} = 1$$

f=5

1.5 Transformations of Functions.

$f(x)$ is the parent function.

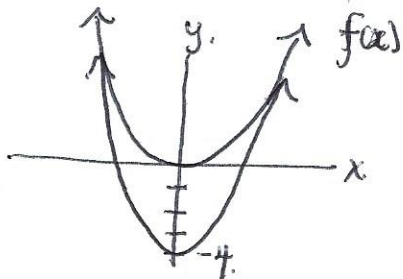
$$g(x) = \underline{a} f(\underline{b}(x-\underline{c})) + \underline{d}$$

$f(x) + d$ Vertical shift

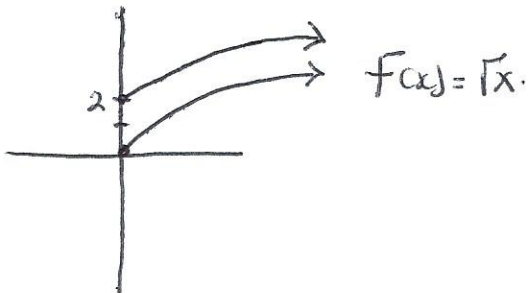
Ex: $g(x) = x^2 - 4$

Parent function $f(x) = x^2$

Shift down 4 units.



Ex: $g(x) = \sqrt{x} + 2$

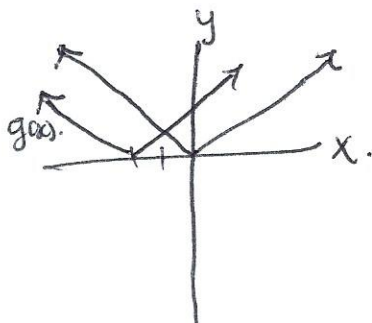


Horizontal Shift:

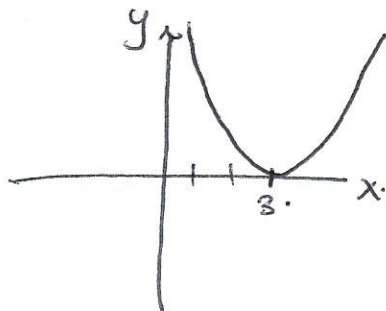
$$g(x) = f(x - c)$$

Adding a value \rightarrow left.
Subtracting " \rightarrow right.

Ex: $g(x) = |x+2|$ $f(x) = |x|$ P-F.

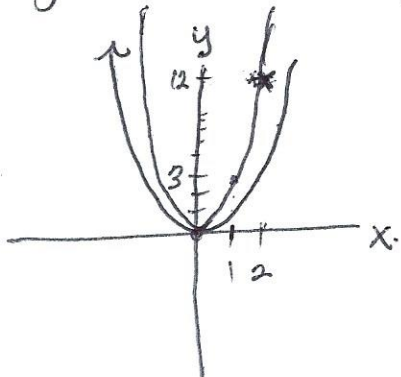


Ex: $g(x) = (x-3)^2$
right 3.



Vertical stretch/shrink.
 $g(x) = a f(x)$.

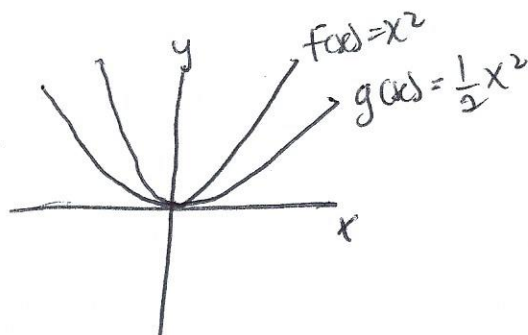
Ex: $g(x) = 3x^2$ $f(x) = x^2$



$a > 1$ vertical stretch.

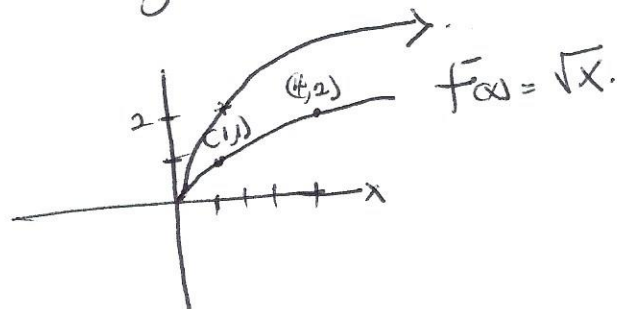
$0 < a < 1$ vertical shrink.

$g(x) = \frac{1}{2} x^2$



Horizontal Stretch / Shrink
 $g(x) = f(bx)$.

Ex: $g(x) = \sqrt{2x}$.



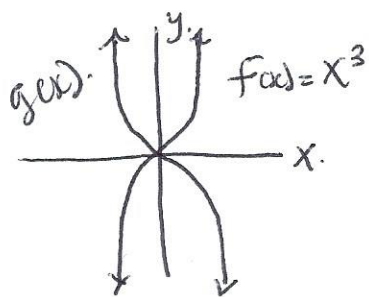
$b > 1 \Rightarrow$ Horizontal shrink.

$0 < b < 1$

horizontal stretch.

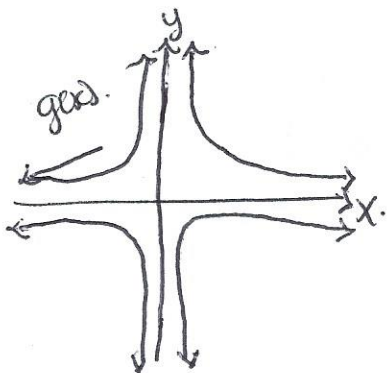
Reflections.

Vertical reflection $g(x) = -f(x)$.



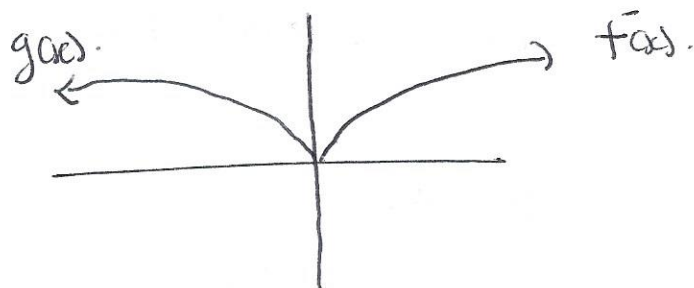
$g(x) = -x^3$.

Ex: $g(x) = -\frac{1}{x}$ $f(x) = \frac{1}{x}$.



Horizontal Reflection over y-axis.

$$g(x) = \sqrt{-x}$$



Given $g(x) = -\sqrt{x+3} - 2$

a). Determine the parent function.

Ans: square root function $f(x) = \sqrt{x}$.

b). List the transformations in the correct order.

c Pg 190.

d.

b

$\frac{a}{d}$ reflection.

left 3.

reflect over x-axis.

down 2

d). Sketch the graph of the parent function and the transformation.