

CHAPTER 3 STATION REVIEW 1

- 1) Consider the equation $y = \frac{5}{x-3} + 4$. Give the equations for the asymptotes of the graph.

$$x = 3$$

$$y = 4$$

- 2) Suppose $T : (x, y) \rightarrow (x+5, y-2)$ is applied to the graph $y = \sqrt{x}$.

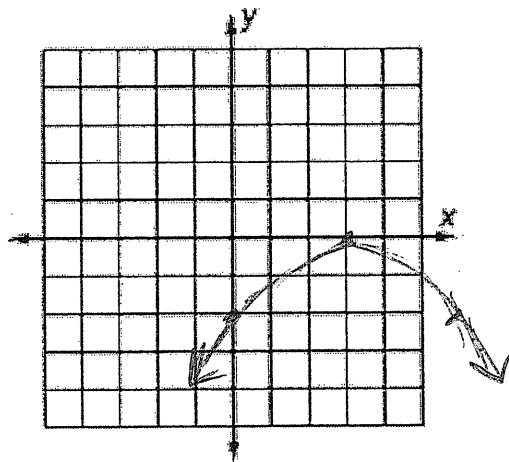
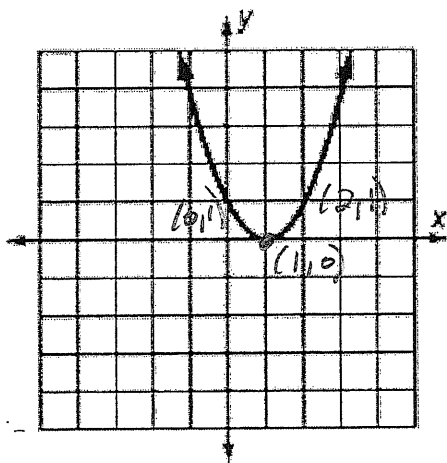
- a) Write an equation for the image.

$$y = \sqrt{x-5} - 2$$

- b) What are the coordinates of the vertex of the image?

$$(5, -2)$$

- 3) The graph of a function F is shown below. Sketch a graph of its image under the transformation S when $S(x, y) = (3x, -2y)$. Be point specific (3 points) when graphing.



$$\begin{aligned} (0, 1) &\rightarrow (3(0), -2(1)) \rightarrow (0, -2) \\ (1, 0) &\rightarrow (3(1), -2(0)) \rightarrow (3, 0) \\ (2, 1) &\rightarrow (3(2), -2(1)) \rightarrow (6, -2) \end{aligned}$$

CHAPTER 3 STATION REVIEW 2

4) Suppose the scale change rule $S(x, y) = \left(\frac{x}{4}, 6y \right)$ is applied to the graph of $y = |x|$.

Write the equation for the image.

$$\frac{y}{6} = |4x|$$

5) Suppose the scale change rule $S(x, y) = \left(5x, \frac{y}{2} \right)$ is applied to the graph of

$y = \frac{1}{x^2}$. Write the equation for the image.

$$2y = \left(\frac{1}{\frac{x}{5}} \right)^2$$

- or -

$$2y = \frac{1}{\left(\frac{x}{5} \right)^2}$$

- or -

$$2y = \left(\frac{5}{x} \right)^2$$

6) Give a rule for a scale change that has a vertical shrink of $1/5$ and a horizontal stretch of 2.

$$S(x, y) \rightarrow \left(2x, \frac{y}{5} \right)$$

CHAPTER 3 STATION REVIEW 3

7) Use the original equation: $y = 2(x+4)^2 - 2$.
 $\sqrt{\text{station } b^2}$
 $L4 \downarrow 2$

$\sqrt{(-4, -2)}$

a) Find an equation for the inverse.

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

$$y + 4 = \pm \sqrt{\frac{x+2}{2}}$$

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

$$\sqrt{\frac{x+2}{2}} = \sqrt{(y+4)^2}$$

$$y^{-1} = \pm \sqrt{\frac{x+2}{2}} - 4$$

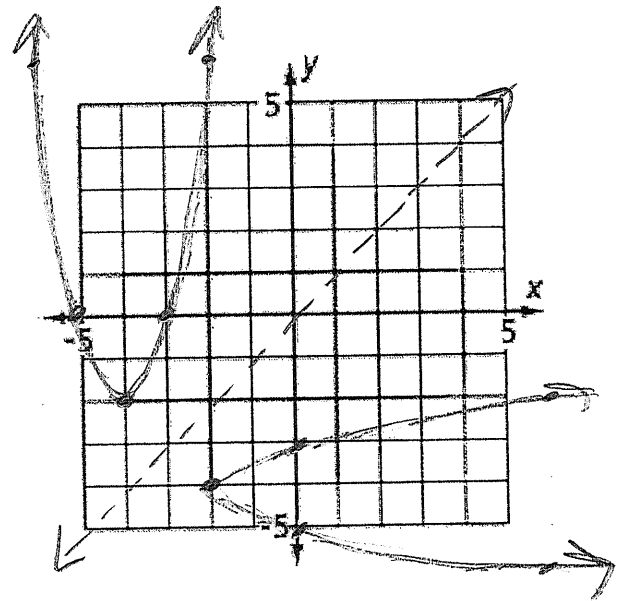
b) Is the inverse a function? Explain.

No, fails VLT.

c) Sketch the graphs of the original and its inverse. Be point specific when graphing.

x	y
-4	-2
-3	0
-5	0
-2	6
-6	6

Inverse	
x	y
-2	-4
0	-3
0	-5
6	-2
6	-4



CHAPTER 3 STATION REVIEW 4

8) Let $f(x) = 6x + 5$ and $g(x) = \frac{3}{x}$

a) Find $f(g(x))$

$$6\left(\frac{3}{x}\right) + 5$$

$$\boxed{\frac{18}{x} + 5}$$

b) State the domain of $f(g(x))$

Domain of $g(x)$: $x \neq 0$

Domain of $f(g(x))$: $x \neq 0$

$$\boxed{D: \{x \mid x \neq 0\}}$$

c) Find $g(f(x))$

$$\boxed{\frac{3}{6x + 5}}$$

d) State the domain of $g(f(x))$

Domain of $f(x)$: All \mathbb{R}

Domain of $g(f(x))$:

$$6x + 5 \neq 0$$

$$\frac{6x}{6} \neq \frac{-5}{6}$$

$$x \neq \frac{-5}{6}$$

$$\boxed{D: \{x \mid x \neq -5/6\}}$$

CHAPTER 3 STATION REVIEW 5

9) Tell whether the function f with equation $f(x) = 3x^2 - 1$ is even, odd, or neither. Support your answer algebraically.

$$\begin{aligned} f(-x) &= 3(-x)^2 - 1 \\ &= 3x^2 - 1 = f(x) \rightarrow \boxed{\text{EVEN}} \\ &\neq -f(x) \rightarrow \underline{\text{NOT ODD}} \end{aligned}$$

10) A data set has a median of 14 and a range of 30.

a. Which statistical measures mentioned above would be affected by a **translation** of data?

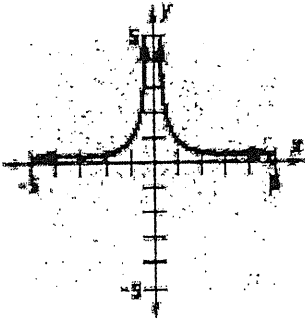
• median would change

b. Which statistical measures mentioned above would be affected by a **scale-change** of data?

• median and range would change

CHAPTER 3 STATION REVIEW 6

11) The graph of function f is shown below.



a) Identify the equation of function f .

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

b) What symmetries does the graph f have?

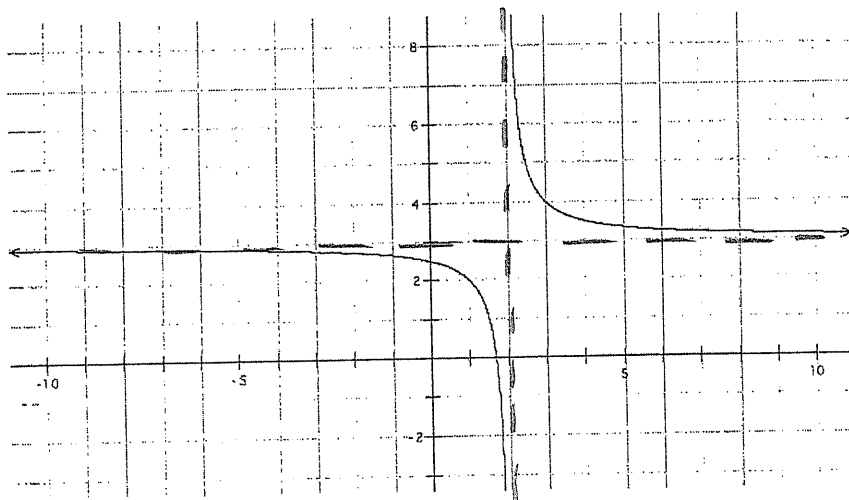
Line $x = 0$

c) Give the domain and range of graph f .

$$D: \{x \mid x \neq 0\}$$

$$R: \{y \mid y > 0\}$$

12) The graph below is a translation image of the parent function $y = \frac{1}{x}$. Write an equation for the function that is graphed.



$$y = \frac{1}{x-2} + 3$$

R2

CHAPTER 3 STATION REVIEW 7

-5

13) Mr. Johnson adjusted the weights of his 14 wrestlers by subtracting 5 pounds from each athlete's weight. The athlete's original weights are described in the initial weight of the table below. Complete the adjusted weight column.

Statistical Measure	Initial Weight	Adjusted weight
C mean	160.29	155.29
S standard deviation	48.41	48.41
C median	148.5	143.5
S range	179	179
S variance	2343.53	2343.53

14) Mr. Johnson will be bringing his wrestlers to Europe. In Europe weight is calculated in Kilograms not pounds. 1 kilogram = 2.2 pounds. Complete the adjusted weight column.

Statistical Measure	Initial Weight	Adjusted weight
mean $\div 2.2$	160.29	72.86
standard deviation $\div 2.2$	48.41	22.00
median $\div 2.2$	148.5	67.5
range $\div 2.2$	179	81.36
variance $\div 2.2^2$	2343.53	484.20

$$K = \frac{\text{Pounds}}{2.2}$$