MPC40S LAFFERTY Key Date: _____

Practice – 1.1 & 1.2

1. Describe, **in words**, the transformation performed on the graph of $y = f(x)$ to obtain the graph of $y = f(x-2)$.

Shift right 2 units.
or
horizontal translation 2 units right

2. Represent a translation of 2 units to the left in **mapping notation** $(x, y) \rightarrow (x-2, y)$

3. How is the graph of $y = f(x)$ related to the graph of $y = f(x) + k$ where $k > 0$?

$y = f(x) + k$ is shifted up.

4. State the vertical and horizontal transformations, **in words**, necessary to obtain the graph of $y = 2f(x+3)$ from the original graph of $y = f(x)$.

Vertical stretch by a factor of 2.
horizontal translation 3 units left

5. The function $y = f(x)$ is translated 3 units to the left and 2 units down. Represent these translations as a function of $y = f(x)$. $y = f(x+3) - 2$

6. The function $y = f(x)$ is translated 8 units to the right and 4 units down. Represent these translations using **mapping notation**. $(x, y) \rightarrow (x+8, y-4)$

7. One root of a function $y = f(x)$ is 5. What must be a root of $y = 2f(x-4)$?

x intercept $(5, 0)$

$(x, y) \rightarrow (x+4, y)$
$(5, 0) \rightarrow (9, 0)$

8. If a point on the graph of $y = f(x)$ is $\left(5, \frac{1}{3}\right)$, then what **point** must be on the graph of $y = 2f(x+1)$? $(x, y) \rightarrow (x-1, 2y)$

$\left(5, \frac{1}{3}\right) \rightarrow \left(4, \frac{2}{3}\right)$

Backwards!

9. A point on the translated graph $y = \frac{1}{2}f(x-3)$ is $(-3, 2)$. What must be a **point** on the **original graph** $y = f(x)$? $(x-3, 2y)$ $(-6, 4)$

10. What ordered pair would result if the ordered pair $(-3, 5)$ was reflected over the x-axis? $(-3, -5)$

$-f(x)$

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11. The graph of $y = f(x)$ underwent the mapping $(x, y) \rightarrow \left(2x, \frac{1}{3}y\right)$. **Explain** what would happen to the y-values on the transformed graph.

The y values would be compressed by a factor of 3 or the y values would by stretched by a factor of $\frac{1}{3}$

12. The graph of $y = f(x)$ underwent a transformation that resulted in the graph of $y = \frac{1}{2}f(3x)$. **Explain** what happened to the x-values on the transformed graph.

The x values would be compressed by a factor of 3. (OR) The x values would be stretched by a factor of 1/3

13. Represent a reflection over the y-axis as a **mapping** $(x, y) \rightarrow (-x, y)$

14. What special name is given to an ordered pair that maps onto itself? (i.e. is not affected by the transformation.) invariant point

15. The graph of $y = f(x)$ is vertically stretched by a factor of 4. Represent this stretch in terms of $y = f(x)$. $y = 4f(x)$

16. Describe, **in words**, how you would obtain the graph of $y = -5f(x)$ from the graph of $y = f(x)$.

Reflect over the x axis
stretch vertically by a factor of 5

17. Describe, **in words**, how the graph of $y = f(x)$ is transformed to the graph of $y = f(-4x)$.

Reflect over the y-axis.
Compress horizontally by a factor of 4
(Stretch horizontally by a factor of $\frac{1}{4}$)

18. What transformation would map the y-intercept of a graph onto itself?

note $(0, y)$ 

→ a reflection over y-axis
or
→ horizontal stretch / compression

19. The graph of $y = f(x)$ undergoes a transformation and results in the new function $y = -2f(5x)$. The transformed graph contains the ordered pair $(-3, 8)$. What **ordered pair** must be on the **original graph**?

Backwards!

$\left(5x, -\frac{y}{2}\right)$ $(-15, -4)$