Section 2.1: 1-5, 10-17, 34, 40-42

1. The domain is $\{3, 4, 0\}$. The range is $\{-2, 4, 1, 2\}$.
Note: Please remove repetitions the next time you write sets.

2. Domain = $\{0, 4, -3, -4\}$. Range = $\{4, 0, -4, -3\}$

3. No, the element 3 from the domain appears more than once. To qualify as a function, a relation must have only one ordered pair for every element of the domain.

4. Yes. Every element in the domain is used once.

5. Yes, you can have a relation that is not a function. However, all functions are necessarily a relation. They both are collections of ordered pairs (a,b) of elements originating from some set A and some set B. However, functions have one extra condition on this collection that a relation does not.

10. No, the 11 in the domain is getting sent to two different places.

11. Yes.

12. No, the 1 in the domain is getting sent to two different places.

13. Yes, this is a function. No element in the domain is repeated twice.

14. This is not a function. A vertical line will intersect the graph twice anywhere in the positive x region.

15. Yes, this is a function.

16. Yes, this is a function.

17. $f(4) = 17(4) + 3 = 68 + 3 = 71$

34. All these functions in this problem are operating on integers only.

   a. INTO. When you try to reverse the multiplication operation, that is just a division. There is always just one answer. So it is into. However, when you try to divide the number 3 by 2, the result is not a whole number anymore. That does not exist in the domain of this problem. So this function is not onto.

   b. INTO and ONTO.

   c. INTO and ONTO.

   d. NONE.

40. B

$$f(-3) = -3(-3) + 7 = 9 + 7 = 16$$

$$g(3) = -7(3) + 3 = -21 + 3 = -18$$

$$f(-3) - g(3) = 16 - (-18) = 16 + 18 = 34$$

41. H. Divide both sides by πr^2

42. C

Section 2.3: 8-10, 17-19, 28-29

8.
$$m = \frac{-1 - 6}{8 - 1} = \frac{-7}{7} = -1$$

9.
$$m = \frac{3 - 9}{0 - (-3)} = \frac{-6}{3} = -2$$

10.
$$m = 6/2 = 3$$

17. $y = 3x + 2$

18. The slope in the picture is $-1/3$, and the y-intercept is -2. So, we get

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

.

19.
$$y = \frac{5}{6}x + 12$$

28 and 29. Ask me to draw it on the whiteboard.

Section 2.4: 10-11, 16-17, 32-33

10.
$$y - 5 = 3(x - 1)$$
$$y - 5 = 3x - 3$$
$$y = 3x + 2$$

11.
$$y - 12 = \frac{5}{6}(x - 22)$$
$$y - 12 = \frac{5x}{6} - \frac{110}{6}$$
$$y = \frac{5x}{6} - \frac{38}{6} = \frac{5x}{6} - \frac{19}{3}$$
$$y = \frac{5x}{6} - \frac{19}{3}$$

16. $m = \frac{8}{-8} = -1$

$$y + 5 = -(x + 2) \quad or \quad y - 3 = -(x + 10)$$

17. $m = 5/4$

$$y = \frac{5}{4}(x - 1) \quad or \quad y - 5 = \frac{5}{4}(x - 5)$$

32.

$$y + 1 = \frac{2}{5}(x - 1)$$

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

$$y = \frac{2}{5}x - \frac{7}{5}$$

33. Perpendicular to the line means you must take the negative reciprocal of the slope they gave you. So, I will use $m = 5/2$

$$y - 1 = \frac{5}{2}(x + 3)$$

$$y - 1 = \frac{5}{2}x + \frac{15}{2}$$

$$y = \frac{5}{2}x + \frac{17}{2}$$