Functions Review Exercise NAMES:

Turn in one paper per group but be sure all members of the group have seen the final answers. Circle your name if the paper that gets turned in is your copy.

The following are selected questions (numbers copied from book) from Set III of the Chapter 3 Summary and Review exercise set.

The weight of an astronaut is a function of his or her distance from the surface of the earth. The weight of an astronaut who weighs 160 pounds at the surface of the earth is given by the formula $w = \frac{2,560}{(d+4)^2}$ in which d is the astronaut's distance from the earth in thousands of miles and w is the astronaut's weight in pounds.

1. Use this formula to complete the following table. Round each weight to the nearest pound.

Distance in thousands of miles, d	0	1	2	3	4	5	6
Weight of astronaut in pounds, w							

For comparison, the moon is 840,000 miles (or $d = 840$) from the Earth. Outer space is considered to be 800 miles (or $d = .8$) from the surface of the Earth.

2. What happens to the astronaut's weight as his or her distance from the earth increases?

3. How much would the astronaut weigh at a distance of 50 thousand miles from the earth? [Include units.]

If an astronaut (who weighs 160 pounds) could travel from the surface of the earth to its center, the astronaut's weight would be given by the formula $w = 160 + 40d$, where w and d are defined as before.

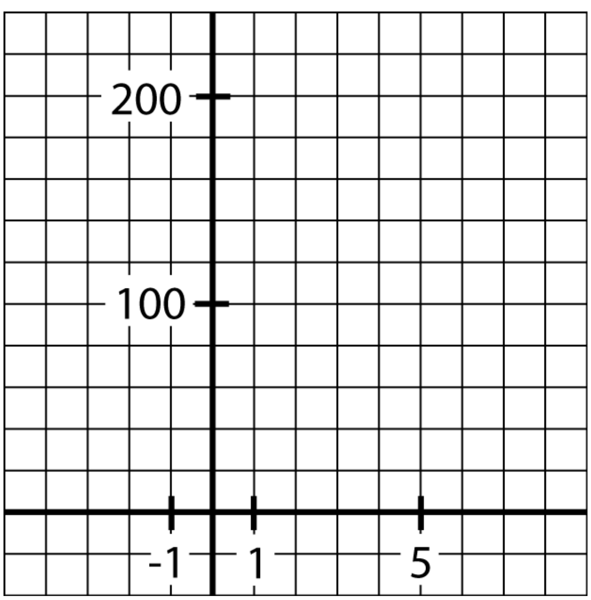
4. Use this formula to complete the following table.

Distance in thousands of miles, *d*	0	-1	-2	-3	-4
Weight of astronaut in pounds, *w*					

The radius of the earth is about four thousand miles so, when $d = -4$, the astronaut would be at the center of the earth.

5. How much would the astronaut weigh at the center of the earth? [Include units.]

6. Graph the astronaut's weight as a function of distance from the surface of the earth by plotting the points from the tables you made for exercises 1 and 4.



7. Where is the astronaut with respect to the earth when he or she is heaviest? [Use your graph to estimate this.]