

For problems 1 and 2 draw a diagram if appropriate, and include these four steps.

1. Read the problem carefully several times.
2. What are you looking for? Use a variable to represent the unknown quantity.
3. Write an equation
4. Solve for x
4. Write a conclusion statement explaining your answer.

1. A built-in bookshelf is to be constructed in a room. The floor to ceiling clearance is 8 ft 2 in. There will be eight shelves. Each shelf is 1 in thick and an equal space is to be left between shelves. What space should there be between each shelf and the next? (There is no shelf against the ceiling and no shelf on the floor.)

2. One side of a rectangular yard is bounded by the side of a house. The other three sides are to be fenced with 345 feet of fencing. The length of fence opposite the house is 15 feet less than either of the other two sides. Find the length and width of the yard.

Part 2: Graphing

Directions: Match each equation from table 1 with the selection from table 2 that fits the equation. Then explain your reasoning to justify your choice.

Equation	Indicate the match from table 2 by letter.	Enter your explanation here. Use complete sentences and try to be as clear as possible.
1. $y = 2x + 1$		
2. $y = x - 3$		
3. $y = \frac{3}{4}x + 1$		
4. $y = 4x + 1$		
5. $y = x + 4$		
6. $2x + 3y = 18$		

Table 1

A. A line that contains the point (2, 6) and (-1, 3).

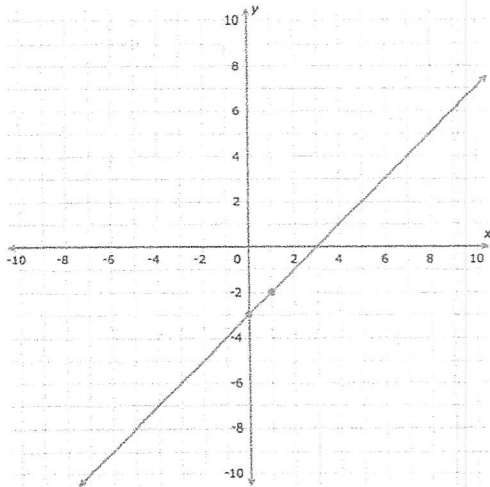
B.

x	y
0	1
4	4
8	7
-4	2
-8	5

C. A line with a slope of 2 and a y-intercept of 1.

D. A line with a y-intercept of 6 and an x-intercept of 9.

E.



F. Mrs. Geer gives her students 1 homework problem during the first week of school, then adds 4 more problems every week after that.

Table 2

Part 3: Geometry

Show all your work and label all answers with the correct units.

You are going to plant a rectangular garden. The dimensions of the garden area will be 8.0 feet by 12.0 feet. Draw a diagram of the garden and label it.

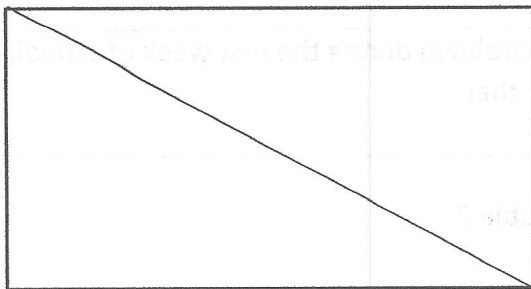
1. How much fencing material will you need to completely enclose the garden?

2. If the fencing material costs \$0.14 per foot, what will be the cost for your fence?

3. How many cubic feet of soil will you need to fill in the garden if you want to go 6 inches deep with the planting soil?

4. If soil is sold by the cubic yard, how many cubic yards will you need?

5. If you divided the garden with a diagonal barrier like the picture shown above, how long would the barrier have to be?



Sara is moving to Hawaii and will live in the rain forest. She need a water tank to catch her own water. The cylindrical tank has a diameter of 7.5 feet and a height of 12.0 feet. Draw a diagram of the tank and label it.

1. What is the volume of the tank in cubic feet?
2. How many gallons of water will it hold? (1 cubic foot = about 7.48 gallons)