MATH 111*i*

HOMEWORK 6

Solutions

DUE THURSDAY, NOVEMBER 2ND

Name:_____

This assignment is worth 100 points. You will be awarded 40 points for attempting the entire assignment (that is answer all problems). All problems will be graded for the remaining 60 points. The space left between each question is indicative of how much work you should show. If there are any problems you find particularly difficult, circle them in red. If there are any particular questions you would like feedback on, circle them in green. These are examples of questions that might appear on an exam/quiz. If you use a calculator to help, make sure you can also do them without it.

1. In a certain Algebra class there is a total of 350 possible points. These points come from 5 homework sets, that are worth 10 points each, and 3 exams, that are worth 100 points each. A student has received homework scores of 4, 8, 7, 7, and 9 and the first two exam scores are 78 and 83. Assume that grades are assigned according to the standard scale (A= 90%, B= 80%, etc.) and there are no weights assigned to any of the grades.

(a) Is it possible for the student to receive an A in the class and if so what is the minimum score on the third exam that will give an A?

$$\frac{4+8+7+7+9+78+83+x}{10+10+10+10+10+100+100+100} = \frac{196+x}{350} = \frac{315}{350} \implies x = 315-196 = 119$$

$$0.9 \times 350 = 315$$

Answer: No it is not possible

(b) What about a B?

$$\frac{196+x}{350} = \frac{280}{350} \implies x = 280-196 = 84$$

$$0.8 \times 350 = 280$$

Answer: Yes it is possible. 84%

2. We want to build a set of shelves. The width of the set of shelves needs to be 4 times the height of the set of shelves and the set of shelves must have three shelves in it. If there are 72 feet of wood to use to build the set of shelves what should the dimensions of the set of shelves be?
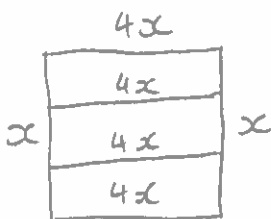
$$P(x) = 4(4x) + 2(x) = 18x = 72$$
$$\implies x = \frac{72}{18} = 4$$
$$\implies 4x = 16$$

Answer: 4×16.

3. We want to fence in a field whose length is twice the width and we have 80 feet of fencing material. If we use all the fencing material what would the dimensions of the field be?
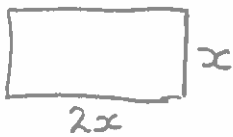
$$P(x) = 2(2x) + 2(x) = 6x = 80$$
$$\Rightarrow x = \frac{80}{6} = \frac{40}{3}$$
$$\Rightarrow 2x = \frac{80}{3}$$

Answer: $\dfrac{40}{3} \times \dfrac{80}{3}$

4. Two cars start at the same point and move in the same direction. One car travels 5mph faster than the twice the speed of other car. After 10 hours the distance separating the two cars is 60 miles. What was the speed of each car?

$$A(t) = xt$$
$$B(t) = (2x+5)t$$

$$\Rightarrow 2x + 5 = 7$$

$$D(t) := B(t) - A(t) = (2x+5)t - xt$$
$$= (x+5)t$$

$$D(10) = (x+5)(10) = 60$$
$$\Rightarrow x + 5 = 6$$
$$\Rightarrow x = 1$$

Answer: $1mph, \ 7mph$

5. Two boats start at the same point. One boat starts traveling to the east at 45 mph and two hours later the second boat starts traveling to the east at 60 mph. At some point in time the faster boat will be 145 miles in front of the slower boat. How long has each boat been traveling when this happens?

$$A(t) = 45t + 90$$
$$B(t) = 60t$$

$$D(t) := B(t) - A(t) = 60t - (45t + 90)$$
$$= 15t - 90$$

$$D(t) = 15t - 90 = 145$$
$$\Rightarrow 15t = 235$$

$$\Rightarrow t = \frac{235}{15} = \frac{47}{3}$$

$$t + 2 = \frac{47}{3} + 2 = \frac{53}{3}$$

Answer: $A: \dfrac{53}{3}$ hrs. $B: \dfrac{47}{3}$ hrs

Cont.

6. One person can mow a field in 52 minutes and a second can mow the same field in 40 minutes. How long would it take the two of them to mow the field together?

A: 1 Field 52 minutes $\Rightarrow A(t) = \frac{1}{52}t$

$\frac{1}{52}$ Fields 1 minute

$A(t) + B(t) = \frac{1}{52}t + \frac{1}{40}t$

B: 1 Field 40 minutes

$\frac{1}{40}$ fields 1 minute $\Rightarrow B(t) = \frac{1}{40}t$

$= \frac{23}{520}t = 1$

Answer: $t = \frac{520}{23}$ minutes

7. There is a field whose width is 6 meters less than its length. If both the length and width are doubled the perimeter will be 120 meters. What are the dimensions of the field?

$$2(2x) + 2(2(x-6))$$
$$= 4x + 4x - 24$$
$$= 8x - 24 = 120$$
$$\Rightarrow 8x = 144$$
$$\Rightarrow x = 18$$
$$\Rightarrow x - 6 = 12$$

Answer: 18×12.

8. A triangular piece of glass has been cut for a stained glass window. Two of the sides are the same length and the third side is 1 inch shorter than the length of the other two sides. If the perimeter is 23 inches what are the lengths of the sides?

$$P(x) = 2x + (x-1)$$
$$= 3x - 1 = 23$$
$$\Rightarrow 3x = 24$$
$$\Rightarrow x = 8$$
$$\Rightarrow x - 1 = 7$$

Answer: $8 \times 8 \times 7$

The End.