Math 2303
Summer 2008
Homework #11

For each of the following word problems, state the definition of each variable used, show the equation that models the problem, solve the equation, and express the answer in the appropriate units.

1. Cat Problem:
If you ask old Ursula how many cats she has at home, she answers sadly: “Four-fifths of my cats plus four-fifths of a cat.” How many cats does this add up to?
Let c = the number of cats Ursula has

Equation: $c = \frac{4}{5} * c + \frac{4}{5} * 1.$

$(c = \frac{4}{5}c + \frac{4}{5}) * 5$

Solve: $5c = 4c + 4$

$5c - 4c = 4c - 4c + 4$

$c = 4$

Answer: Ursula has 4 cats

2. In my college algebra class, I noticed the following interesting fact about my class size. One-third of the number of students in the class is the same as 20 more than one-fifth of the number of students. How many are enrolled in the class?
Let x = number of students in my class

Equation: $\frac{1}{3}x = 20 + \frac{1}{5}x$

$15 * (\frac{1}{3}x = 20 + \frac{1}{5}x)$

$5x = 300 + 3x$

Solve: $5x - 3x = 300 + 3x - 3x$

$2x = 300$

$x = 150$

Answer: There are 150 students in my class.

3. David bought 3 video games at Wal-Mart yesterday. Each game cost the same amount. He also bought a $5 pair of flip-flops. Before tax, the total purchase came to $110. What is the price of each video game?
Let x be the cost of a video game
Equation: 3x + 5 = 110
Solution: x=35
Answer: Each video game cost $35.

4. The local car dealership is offering a special on a new car. The advertised price is $13,000. The dealership will give you 100 gallons of free gas with that purchase. You do a little research and find out that gas costs $4.03 a gallon and you can find the same car at another dealership for $12,250 (without any free gas). How many gallons of gas could you buy with the extra money the "special deal" cost?
Exta money = 13000 – 12250 = 750 dollars
X = how many gallons you can buy with the extra.
Equation 4.03X = 750
Solution: X = 186.1
So if you bought the car for $12,250, you could buy 186 gallons of gas for the same price as the car plus 100 gallons of gas "on sale".

5. 3 more than 5 times a number is 33. What is the number?
Let n be the number
The equation is 3 + 5n = 33
Solve: 5n = 33 – 3 = 30 n = 6
Answer: the number is 6.

6. Fred is planning the class tour of the museum. He has two different pricing plans for the day's outing. One company charges a $220 basic fee for a day trip plus $3.75 per person on the trip. The other company only charges a $70 basic fee, but charges $5.25 per person for the trip. Fred discovers that with the number of people going on the trip, the two price schedules work out to be the same cost. How many people are going on the trip?
Let p = the number of people on the trip
Then the cost of plan 1 is 220 + 3.75p
The cost of plan 2 is 70 + 5.25p
Equation: $220 + 3.75p = 70 + 5.25p$
Solution: $220 - 70 + 3.75p - 3.75p = 70 - 70 + 5.25p - 3.75p$
150 = 1.5p
Answer: p =100 there were 100 people on the trip.

7. Farmer Brown has a box of fruit in his kitchen with a total of 36 pieces of fruit in it. The box contains apples and oranges. The number of apples is three more than twice the number of oranges. How many oranges are in the box?
Let x = the number of oranges in the box.
Then the number of apples is 2x+3
Total number of fruit in the box = 36 = apples plus oranges.
Equation: x + 2x + 3 = 36
Solve: 3x + 3 = 36 3x = 33 x = 11
Answer: There are 11 oranges in the box.