Fun Word Problems Sheet Seven

You must get all parts of a problem correct to get the point, so be careful and check your work!

1. Find the length of a rectangle whose length is twice its width and its width is:

   (a) 3 feet
   (b) 10 inches
   (c) 4 inches
   (d) 7 feet
   (e) x inches

   Solution: Make sure the units match! Otherwise, to get the length, just multiply the width by two. Also, it seemed like some folks assumed this was looking for area or perimeter. Read the problem carefully several times to be sure what it is giving you, and what it is asking for!

Width (input, x)	Length (output, y)
3 feet	6 feet
10 inches	20 inches
4 inches	8 inches
7 feet	7 feet
x inches	$2x$ inches

2. Find the width of a rectangle whose width is one-half of its length and its length is:

   (a) 4 feet
   (b) 10 inches
   (c) 6 inches
   (d) 7 feet
   (e) x inches

   Solution: The word "of" often translates into multiplication, and this problem is an example of that. "one-half of" translates into $\frac{1}{2} \cdot ()$"

Length (input, x)	Width (output, y)
4 feet	2 feet
10 inches	5 inches
6 inches	3 inches
7 feet	3.5 feet
x inches	$\frac{x}{2}$ or $\frac{1}{2}x$ inches

3. Find the total travel distance in miles if you are averaging 60 mph and travel for:

   (a) 2 hours

   (b) 5 hours

   (c) 1.5 hours

   (d) 30 minutes

   (e) t hours

Solution: A "rate" tells you how much of one quantity happens for each occurance of another quantity. For example, when your pay rate is 12 dollars per hour, you will make \$12 for each hour that you work. \$12 for one hour, \$24 for two hours, \$36 for three hours, and even \$30 for 2.5 hours. Traveling rates work the same way. To go 60 miles per hour means for every hour that you travel, you will cover a distance of 60 miles.

Consequently, the formula distance is rate times time ($d = rt$) works as long as the units match. Miles per hour times hours equals miles, but miles per hour times minutes equals nothing that makes sense. Convert 30 minutes to 0.5 hours. In general, use the conversion rate $\frac{1\text{hour}}{60\text{minutes}}$ to convert minutes to hours: $\frac{x}{1}\text{minutes} \cdot \frac{1\text{hour}}{60\text{minutes}}$ equals $\frac{x}{60}$ hours.

Rate in mph (constant)	Time in hours (input, x)	Distance in miles (output, y)
60 mph	2 hours	120 miles
60 mph	5 hours	300 miles
60 mph	1.5 hours	90 miles
60 mph	30 minutes equals 0.5 hours	30 miles
60 mph	t hours	$60t$ miles

4. Find the total cost of 2 hot dogs and 3 hamburgers if hamburgers cost twice as much as hot dogs and hot dogs cost:

   (a) \$1

   (b) \$2

   (c) \$1.50

   (d) \$7 (You never know. Someday it might cost this much!)

   (e) $\$x$

   Solution: The total cost for hot dogs is dependant on the price per hot dog. The total cost for hamburgers is dependant on the price per hamburger which in turn is dependant on the price of hot dogs. Lots of "middle steps" on the following table...

Cost per hot dog (input, x)	Total hot dog cost (middle step)	Cost per hamburger (middle step)	Total hamburger cost (middle step)	Total cost (output, y)
\$1	\$2	\$2	\$6	\$8
\$2	\$4	\$4	\$12	\$16
\$1.50	\$3	\$3	\$9	\$12
\$7	\$14	\$14	\$42	\$56
$\$x$	$\$2x$	$\$2x$	$\$6x$	$\$8x$

5. Find the sale price of a pair of sneakers with original price of \$100 and its price is discounted by:

   (a) \$10

   (b) \$15

   (c) \$8

   (d) \$23.50

   (e) $\$x$

   Soultion: Original price minus the discount is the sale price.

Original price (constant)	Discount (input, x)	Sale price (output, y)
\$100	\$10	\$90
\$100	\$15	\$85
\$100	\$8	\$92
\$100	\$23.50	\$76.50
\$100	$\$x$	$100 - x$ dollars