

Function Word Problems Algebra II pg. 150

1) a) \$ 3150	b) 5780m
b) 3yrs 8mos	a) 11:45 A.M.
2) a) \$ 36.75	b) $C(x) = \frac{5x-160}{9}$
b) 120mi	a) 37°C
3) a) \$ 235	b) -40°
b) \$ 2650	a) 150
4) a) \$ 275	b) -50
b) 64 cm	a) $f(x) = \frac{1}{2}x + 25$
5) a) 179 lbs	b) 80
b) 70 days	

2) The charge for a one-day rental of a car from Shurtz Car Rental Agency is \$24 plus 15 cents for each mile driven.

input: miles
output: cost

$$F(x) = mx + b$$

$$F(x) = .15x + 24$$

a. If Jill drives 85 mi in one day, how much is the charge?

$$F(85) = .15(85) + 24$$

$$= 12.75 + 24$$

$$= \$36.75$$

b. If a one-day rental cost Jill \$42, how far did she drive?

$$42 = .15x + 24$$

3) A plumber charged \$110 for a three-hour job and \$160 for a five-hour job. At this rate, how much would he charge for an eight-hour job?

input: hours
output: price

$(3, 110)$ $(5, 160)$

$$m = \frac{160 - 110}{5 - 3} = \frac{50}{2} = 25$$

$$110 = 25(3) + b$$

$$110 = 75 + b$$

$$35 = b$$

$$P(x) = mx + b$$

$$P(x) = 25x + b$$

$$P(x) = 25x + 35$$

$$P(8) = 25(8) + 35$$

4) It costs Ace Electronics Company \$1900 to manufacture 10 VCRs and \$2200 to manufacture 16 VCRs. At this rate, what would be the cost of manufacturing 25 VCRs?

cause: amt VCRs built
effect: cost

$(10, 1900)$ $(16, 2200)$

$$V(x) = mx + b$$

6) A load of 8 kg attached to the bottom of a coil spring stretches the spring to a length of 76 cm, and a load of 14 kg stretches it to a length of 85 cm. Find the natural (unstretched) length of the spring.

input: mass
output: stretch

$(8, 76)$ $(14, 85)$

$$m = \frac{85 - 76}{14 - 8} = \frac{9}{6} = \frac{3}{2}$$

$$76 = \frac{3}{2}(8) + b$$

$$76 = 12 + b$$

$$64 = b$$

$$H(x) = \frac{3}{2}x + 64 \text{ cm}$$

7) Fifteen days after Alan began a diet he weighed 176 lb. After 45 days he weighed 170 lb.

input: days
output: wt.

a. How much did he weigh at the beginning of the diet?

$(15, 176)$ $(45, 170)$

$$D(x) = mx + b$$

$$D(x) = -\frac{1}{5}x + b$$

$$176 = -\frac{1}{5}(15) + b$$

$$176 = -3 + b$$

$$179 = b$$

179 lbs

b. At this rate, when will he weigh 165 lb?

$$D(x) = -\frac{1}{5}x + 179$$

$$165 = -\frac{1}{5}x + 179$$

8) A climber left base camp at 5 A.M. to ascend a 7400-meter peak. The climber gained altitude at a rate of 240 m/hr and at 8 A.M. was at the 6500-meter level.

a. Find the elevation of the base camp.

$Z(x) = mx + b$
 $Z(x) = 240x + b$
 $Z(3) = 240(3) + b$
 $6500 = 720 + b$
 $5780 = b$ **5780 ft**

b. At what time did the climber reach the summit?

$7400 = 240x + 5780$

input: time climbing
output: elevation

	°C	°F
Freezing	0°	32°
Boiling	100°	212°

9) The side table shows the freezing and boiling points of water in degrees Celsius and degrees Fahrenheit.

a. Find a linear function that gives °C in terms of °F.

$C(F) = mF + b$
 $C(F) = \frac{5}{9}F + b$
 $C(F) = \frac{5}{9}F - \frac{160}{9}$

b. At what °C temperature corresponds to 98.6°F?

$C = \frac{5}{9}(98.6) - \frac{160}{9}$

c. At what temperature do the two scales give the same reading?

input = output
 $F = F$
 $F = \frac{5}{9}F - \frac{160}{9}$

$(32, 0)$
 $(212, 100)$
 $m = \frac{100 - 0}{212 - 32} = \frac{100}{180} = \frac{5}{9}$
 $0 = \frac{5}{9}(32) + b$
 $-\frac{160}{9} = b$

10) On a 50 question true-false test, a student received 3 points for each correct answer. For each incorrect answer, the student lost 1 point. For unanswered questions, no points are added or subtracted.

a. Find the best score possible.

b. Find the worst score possible.

c. Find the linear function that converts the raw score described above to a score from 0 to 100.

$F(x) = mx + b$

d. What score from 0 to 100 corresponds to a test result of 38 correct, 4 incorrect, and 8 omitted?

$F(110) = 38(3) - 4 + 0(8)$
 $114 - 4 = 110$

$3(50) = 150$
 $-1(50) = -50$
 $(-50, 0)$ $(150, 100)$