2-1-3 (and 2-2) Activity

1. Slimy Sam is on the lam from the law. Being not-too-smart, he drives the clunker of a car he stole east on I-70 across Ohio. Because the car can only go a maximum of 52 miles per hour, he floors it all the way from where he stole the car (just now at the Rest Area 5 miles west of the Indiana line) and goes as far as he can before running out of gas 3.78 hours from now.

1. Where will he be 3 hours after stealing the car?
2. Where will he be when he runs out of gas and is arrested?
3. Where will he be *x* hours after stealing the car?
4. Answer parts (c) and (f) if the car goes a maximum of *m* miles per hour and he started *b* miles east of the Ohio-Indiana border.
5. What “form” of the equation of a line does this problem motivate?

1. Free-Lance Freddy works for constant hourly rates, depending on the job. He also carries some spare cash for lunch. To make his employers sweat, Freddy keeps a meter on his belt telling how much money they currently owe (with his lunch money added in, thus giving the total amount of money he has).
   1. On Monday, 3 hours into his work as a gourmet burger flipper, Freddy’s meter reads $42. 7 hours into his work, his meter reads $86. ***Without finding his amount of lunch money***, if he works for 12 hours, how much money will he have? When will he have $196?
   2. On Tuesday, Freddy is CEO of the We Say So Company. After 2.53 hours of work, his meter reads $863.15 and after 5.71 hours of work, his meter reads $1349.78. Without finding his amount of lunch money, if he works for 10.34 hours, how much money will he have? How much time will he be in office to have $1759.21?
   3. ???On Wednesday, Freddy is starting goalie for the Columbus Blue Jackets. After hours of work, his meter reads dollars and after hours of work, his meter readsdollars. Without finding his amount of lunch money, if he works for *x* hours, how much money will he have? How much time will he be in front of the net to have *y* dollars?
   4. What “form” of the equation of a line does this problem motivate?

1. Counterfeit Cathy sells two kinds of cereal: Square Cheerios for $4 per pound and Sugarless Sugar Pops for $5 per pound.

If Cathy’s goal for today is to sell $1000 of cereal, how much of each kind should she sell?

* 1. Assume *x* is the number of pounds of Square Cheerios she sells and *y* is the number of pounds of Sugarless Sugar Pops she sells.
  2. What does the slope stand for in this situation? The y-intercept? The x-intercept?
  3. If she sells Square Cheerios for *a* dollars per pound and Sugarless Sugar Pops for *b* dollars per pound and she wants to sell *c* dollars of cereal, write an equation that relates the amount of Sugar Pops Cathy sells to the amount of Cheerios she sells. What “form” of the equation of a line does this problem motivate?

OR

1. Roger likes to run each morning. He brings along a clock and a pedometer to check the time and how far he has gone.

* 1. On Monday, he started out at 6AM and sees that at 6:20 he’s gone 4 miles, what will the pedometer read at 6:50?
  2. If, on Tuesday, he again starts out at 6AM and his pedometer reads 3.64 miles at 6:23AM, what will the pedometer read at 6:54AM?
  3. On Wednesday, Roger forgot what time he started. However, he reads on his pedometer that at 6: 04 he had gone 4.83 miles and at 6:19 he had gone 7.51 miles. How far will he had gone 51 minutes into his run? At what time would he have gone 2 miles?

MFG 1.18 (Lin. Models): The manager at Albert's Appliances has $3000 to spend on advertising for the next fiscal quarter. A 30-second spot on television costs $150 per broadcast, and a 30-second radio ad costs $50.

1. The manager decides to buy xx television ads and yy radio ads. Write an equation relating xx and y.y.
2. Make a table of values showing several choices for xx and y.y.
3. Assuming x = # of 30-second TV ads and y = # of 30 second radio ads, what do the intercepts tell us about the problem?

The x-intercept tells us:

A) the cost of the TV ads.  
 B) the best number of TV ads.  
 C) the most TV ads she can buy for the money.  
 D) the average number of TV ads.

The y-intercept tells us:

A) the cost of the radio ads.  
 B) the number of radio ads she bought  
 C) the number of radio ads if no TV ads are bought.  
 D) the average cost per ad.

MFG Lin. Model Exercises #4: Leon's camper has a 20-gallon gas tank, and he gets 1212 miles to the gallon. (That is, he uses 112 gallon per mile.) Complete the table of values for the amount of gas, g,g, left in Leon's tank after driving mm miles.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| mm | 00 | 4848 | 9696 | 144144 | 192192 |
| gg | 0000 | 0000 | 0000 | 0000 | 0000 |

1. Write an equation that expresses the amount of gas, g,g, in Leon's fuel tank in terms of the number of miles, m,m, he has driven.
2. Graph the equation.
3. How much gas will Leon use between 8 a.m., when his odometer reads 9696 miles, and 9 a.m., when the odometer reads 144144 miles? Illustrate on the graph.
4. If Leon has less than 55 gallons of gas left, how many miles has he driven? Illustrate on the graph.

MFg Lin. Models exercises #26 Five pounds of body fat is equivalent to 16,00016,000 calories. Carol can burn 600600 calories per hour bicycling and 400400 calories per hour swimming.

1. How many calories will Carol burn in xx hours of cycling? How many calories will she burn in yy hours of swimming?
2. Write an equation in general form that relates the number of hours, x,x, of cycling and the number of hours, y,y, of swimming Carol needs to perform in order to lose 55 pounds.
3. Find the intercepts and sketch the graph.
4. What do the intercepts tell us about Carol's exercise program?

Two rent-a-car: Both in slope-int description (# dollars per mile + initial fee) Which company to choose?

MFG Checkpoint 1.140 (Lin. Functions): A healthy weight for a young woman of average height, 64 inches, is 120 pounds. To calculate a healthy weight for a woman taller than 64 inches, add 5 pounds for each inch of height over 64.

1. Write a linear equation in point-slope form for the healthy weight, W, for a woman of height, H, in inches.

W=

1. Write the equation in slope-intercept form.

W=

MFG Exercises: #32 (Lin. Functions): The table shows the amount of ammonium chloride salt, in grams, that can be dissolved in 100100 grams of water at different temperatures.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Temperature, ∘∘C | 1010 | 1212 | 1515 | 2121 | 2525 | 4040 | 5252 |
| Grams of salt | 3333 | 3434 | 35.535.5 | 38.538.5 | 40.540.5 | 4848 | 5454 |

1. Plot the data on graph paper and draw a straight line through the points. Estimate the yy-intercept of your graph.
2. Find an equation for the line.
3. At what temperature will 4646 grams of salt dissolve?

ORCCA: p. 221 #45 (#46 interprets y-int): An engine’s tank can hold 60 gallons of gasoline. It was refilled with a full tank, and has been running without breaks, consuming 3 gallons of gas per hour. Assume the engine has been running for x hours since its tank was refilled, and assume there are y gallons of gas left in the tank. Use a linear equation to model the amount of gas in the tank as time passes. Find this line’s x-intercept, and interpret its meaning in this context.

⊙ A. The x-intercept is (60,0). It implies the engine will run out of gas 60 hours after its tank was refilled. ⊙ B. The x-intercept is (20,0). It implies the engine will run out of gas 20 hours after its tank was refilled. ⊙ C. The x-intercept is (0,20). It implies the engine started with 20 gallons of gas in its tank.

⊙ D. The x-intercept is (0,60). It implies the engine started with 60 gallons of gas in its tank

Calc-Medic 0.5; Gives price of ice cream with 1 topping and ice cream with 4 toppings (what is price for a topping)? Predict with no toppings, other # of toppings. #3 slope/int form and asking when will y = 5000 (wedding guests like in 1116). #4: Netflix sales starting in 2013. Predict 2015, 2020.

0.6: Didt. From store vs. time: Comparing several lines (people). Also, Given point-slope form of line perp. To another one. If other line has (-1, 4) and (5, k), find k.