1 Worksheet 1: Solutions

1.1 Solve:

Find the opposite:

-5 $\quad$ 5

10 $\quad$ -10

-1 $\quad$ 1

Order from smallest to largest':

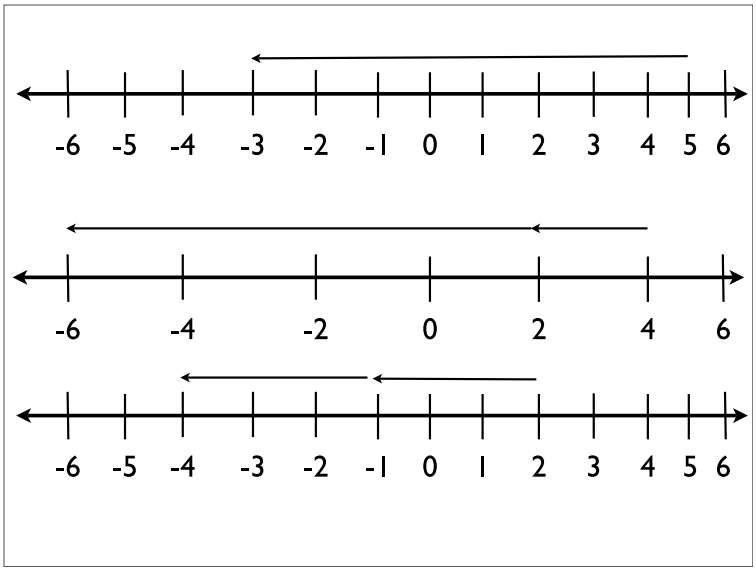
$-10, 2$ $\quad$ $-10 < 2$

$-10, -11$ $\quad$ $-11 < -10$

$-21, -20, 0$ $\quad$ $-21 < -20 < 0$

$-5, -3, 1, 2$ $\quad$ $-5 < -3 < 1 < 2$

Convert the following number lines into sums:



$5 + -8 = -3$

$4 - 2 - 8 = -6$

$2 - 3 - 3 = -4$

Solve:

$n = -5 + 3$ $\quad n = -2$

$x = 10 + -4$ $\quad x = 6$

$x = -5 \times -2$ $\quad x = -7$

$n = 5 \times -2$ $\quad n = 3$

$x = 5 \times 1$ $\quad x = 5$

$y = 3 \times 0$ $\quad y = 0$

$q = -5 \times -3 \times 1$ $\quad q = 15$

$z = 4 \times -2 \times 3$ $\quad z = -24$

$x = 37 \times -25 \times 0$ $\quad x = 0$

$x = -5 + -7$ $\quad x = -12$

$x - 3 = 2$ $\quad x = 5$

$n + 2 = -5$ $\quad n = -7$

1.2 Word Problems

1. Christine has 20 dollars in the bank. She puts in (deposits) 10 dollars, withdraws 25 dollars, and then withdraws five dollars two more times.

   - Write an expression for the amount of money she has in the bank after all of these transactions.

     $m = 20 + 10 - 25 - (2 \times 5)$

   - How much money does she need to deposit or withdraw in order to have exactly zero dollars in the bank?
     $m = 20 + 10 - 25 - 10$

     $m = -5$

She needs to put in or deposit 5 more dollars.

2. Bob gets into an elevator on the sixteenth floor. He goes up five floors, down seven floors, up two floors, and down two floors.

   - Draw a diagram to represent this situation.
   - How many floors is Bob from the first floor at the end of his trip?
     $f = 16 + 5 - 7 + 2 - 2$

     $f = 14$

     Bob needs to go down 13 floors to get to the 1st floor.

3. A man is searching for buried treasure. Every year he digs 10 meters further down.

   - After five years, how many meters down has the man dug?
     $h = 10 \times 5$ meters

     $h = 50$ meters

   - How about after twenty years?
     $h = 20 \times 5$ meters

     $h = 100$ meters

   - Every years the wind refills the hole the man is digging. It fills in two meters every year. After five years, how many meters has the wind filled in?
     $w = 2 \times 5$ meters

     $w = 10$ meters

   - After five years, what is the net depth of the hole?
     The man has dug 50 meters, and the wind has filled in 10, so the hole is 40 meters deep after five years.

4. An apple tree grows upwards at a rate of five meters per year.

   - How tall is the tree after five years?
     $h = 5 \times 5 = 25$

- After ten years, the tree starts to make apples. If an apple falls from one half of the tree height, how far does it fall?

  $h = 10 \times 5 = 50$ meters

  The apple falls 25 meters.

- While the tree is growing up, the roots are growing downward. The roots grow two meters per year. After ten years, how long is the tree from the top to the bottom?

  $d = -2 \times 10 = -20$ meters

  The tree is 20 meters deep and 50 meters high, so the entire tree is 70 meters.

5. Thomas earns \$2,000 per month after tax. His rent is \$500 per month, his car payment is \$100 per month, he puts \$100 per month into long-term savings, and his telephone and utility bills are \$200 per month. Thomas wants to save up for a vacation that will cost \$2400. Work out a budget for him, i.e. how much he can spend per month on food, clothes and entertainment that will let him take the vacation after one year.

   Thomas' expenditures per month are \$500 + \$100 + \$100 + \$200, or \$900 total. After spending this, he has \$2,000 - \$900 = \$1,100 left. If he wants to save up for a year for his vacation, which costs \$2,400, he will have to save \$2,400 ÷ 12 = \$200 per month. This means that he has \$1,100 - \$200 = \$900 per month for all his other expenditures - food, gasoline, clothes, entertainment. If he stays within this budget he'll be able to take his vacation.