



2. What value of  $a$  will make the equation a true statement? Explain how you arrived at your solution.

$$\left(-\frac{3}{4} + \frac{4}{3}\right) + a = 0$$

$$+\frac{3}{4} - \frac{4}{3}$$

$$a = \frac{3}{3} \cdot \frac{3}{4} - \frac{4}{3} \cdot \frac{4}{4}$$

$$a = \frac{9}{12} - \frac{16}{12}$$

$$a = \frac{9-16}{12}$$

$$a = \frac{-7}{12}$$

Need the opposite values of  $-\frac{3}{4} + \frac{4}{3}$ .

To add these, get a common denominator.

3. Every month, Ms. Thomas pays her car loan through automatic payments (withdrawals) from her savings account. She pays the same amount on her car loan each month. At the end of the year, her savings account balance changed by  $-\$2,931$  from payments made on her car loan. (Remember, there are 12 months in a year.)

a. What is the change in Ms. Thomas' savings account balance each month due to her car payment?

$$-\$2,931 = \text{Jan} + \text{Feb} + \text{Mar} + \text{Apr} + \text{May} + \text{Jun} + \text{Jul} + \text{Aug} + \text{Sept} + \text{Oct} + \text{Nov} + \text{Dec}$$

$$-\$2,931 = \frac{12 \times \boxed{\phantom{000}}}{12}$$

$$-\$244.25 = \boxed{\phantom{000}}$$

$$\begin{array}{r} 244.25 \\ 12 \overline{) 2931.00} \\ \underline{-24} \phantom{00} \\ 53 \phantom{00} \\ \underline{-48} \phantom{00} \\ 51 \phantom{00} \\ \underline{-48} \phantom{00} \\ 30 \phantom{00} \\ \underline{-30} \phantom{00} \\ 00 \end{array}$$

b. Describe the total change to Ms. Thomas' savings account balance after making six monthly payments on her car loan. Model your answer using a number sentence.

$$6 \times (-\$244.25) \quad \text{OR} \quad -\$2,931 \div 2$$

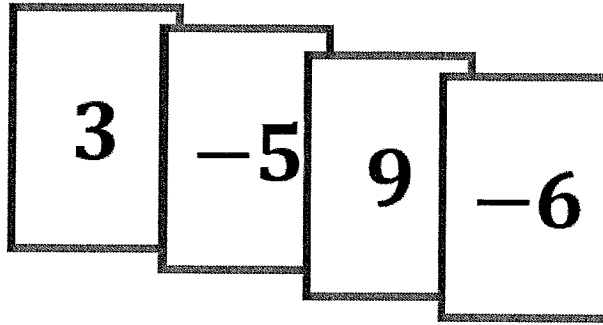
$$\begin{array}{r} 221.3 \\ -244.25 \\ \times 6 \\ \hline -1,465.50 \end{array}$$

$$\begin{array}{r} 1465.5 \\ 2 \overline{) 2931.0} \\ \underline{-2} \phantom{00} \\ 09 \phantom{00} \\ \underline{-8} \phantom{00} \\ 13 \phantom{00} \\ \underline{-12} \phantom{00} \\ 11 \phantom{00} \\ \underline{-10} \phantom{00} \\ 10 \end{array}$$

$$\boxed{-1,465.50}$$

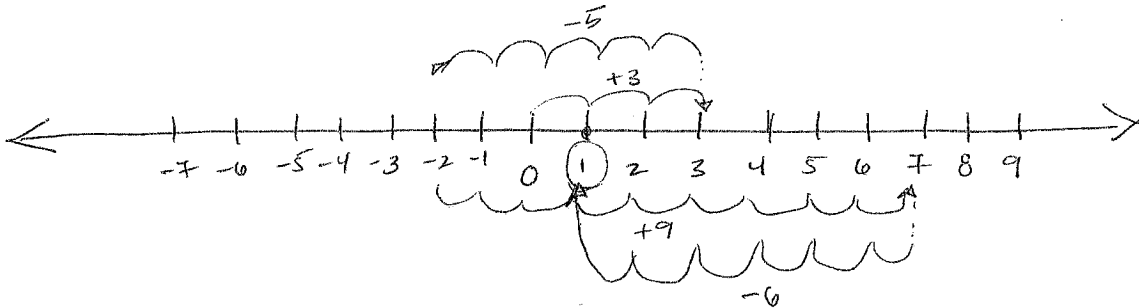
4. Jesse and Miya are playing the Integer Card Game. The cards in Jesse's hand are shown below:

Jesse's Hand  
3, -5, 9, -6



a. What is the total score of Jesse's hand? Support your answer by showing your work.

$$3 + (-5) + 9 + (-6) = 1$$

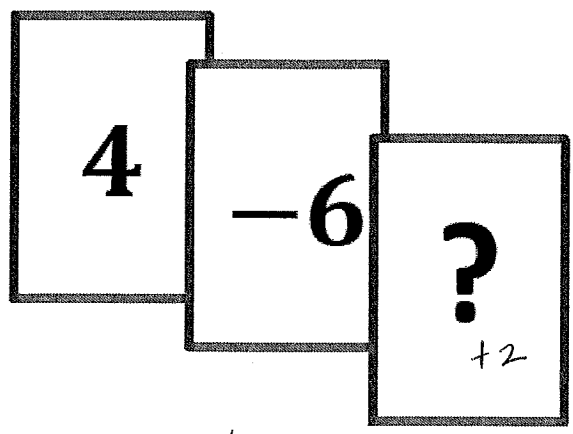


b. Jesse picks up two more cards, but they do not affect his overall point total. State the value of each of the two cards, and tell why they do not affect his overall point total.

ANY + & - VALUE COMBINATION:

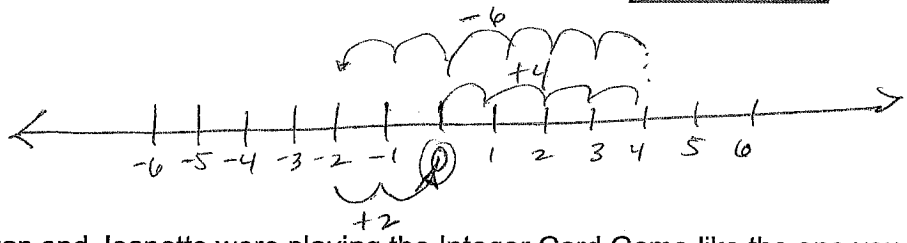
- +1 & -1
- +2 & -2
- +4 & -4
- +7 & -7
- +8 & -8

c. Complete Jesse's new hand to make this total score equal zero. What must be the value of the ? card? Explain how you arrived at your answer.



$$4 + (-6) = -2 + 2 = 0$$

= ?  
card



6. Bryan and Jeanette were playing the Integer Card Game like the one you played in class. They were practicing adding and subtracting integers. Jeanette had a score of  $-10$ . Bryan took away one of Jeanette's cards. He showed it to her. It was a  $-8$ . Jeanette recalculated her score to be  $-2$ , but Bryan disagreed. He said that her score should be  $-18$  instead. Read their conversation, and answer the question below.

"No, Jeanette, removing a negative card means the same thing as subtracting a positive. So, negative 10 minus negative 8 is negative 18."

"It does not! Removing a negative card is the same as adding the same positive card. My score will go up. Negative 10 minus negative 8 is negative 2."

Based on their disagreement, who, if anyone, is right? Explain.

$$\square\square\square\square = -10$$

$$\square\square\square\cancel{\square} = ?$$

remove = subtract

$$-10 - (-8) = -10 + 8 = -2$$

subtract a negative  $\rightarrow$  add a positive

JEANETTE IS CORRECT

7. The table below shows the temperature changes Monday morning in Bedford, New York over a 4-hour period after a cold front came through.

a. If the beginning temperature was  $-13^{\circ}\text{F}$  at 5:00 a.m., what was the temperature at 9:00 a.m.?

Change in Temperature	
5:00 a.m. – 6:00 a.m.	$-3^{\circ}\text{F}$
6:00 a.m. – 7:00 a.m.	$-2^{\circ}\text{F}$
7:00 a.m. – 8:00 a.m.	$-6^{\circ}\text{F}$
8:00 a.m. – 9:00 a.m.	$7^{\circ}\text{F}$

$$\begin{array}{r}
 5\text{AM} = -13^{\circ}\text{F} \\
 \underline{-3^{\circ}\text{F}} \\
 6\text{AM} = -16^{\circ}\text{F} \\
 \underline{-2^{\circ}\text{F}} \\
 7\text{AM} = -18^{\circ}\text{F} \\
 \underline{-6^{\circ}\text{F}} \\
 8\text{AM} = -24^{\circ}\text{F} \\
 \underline{+7^{\circ}\text{F}} \\
 9\text{AM} = -17^{\circ}\text{F}
 \end{array}$$

$$\boxed{-17^{\circ}\text{F}} \text{ AT } 9\text{AM}$$

b. The same cold front hit Hartford, Connecticut the next morning. The temperature dropped by  $7^{\circ}\text{F}$  each hour from 5:00 a.m. to 9:00 a.m. What was the beginning temperature at 5:00 a.m. if the temperature at 9:00 a.m. was  $-10^{\circ}\text{F}$ ?

$$\begin{array}{r}
 5\text{AM} \quad 18^{\circ}\text{F} \\
 \underline{-7^{\circ}\text{F}} \quad \left. \begin{array}{l} \uparrow \\ \uparrow \end{array} \right\} +7^{\circ}\text{F} \\
 6\text{AM} \quad 11^{\circ}\text{F} \\
 \underline{-7^{\circ}\text{F}} \quad \left. \begin{array}{l} \uparrow \\ \uparrow \end{array} \right\} +7^{\circ}\text{F} \\
 7\text{AM} \quad 4^{\circ}\text{F} \\
 \underline{-7^{\circ}\text{F}} \quad \left. \begin{array}{l} \uparrow \\ \uparrow \end{array} \right\} +7^{\circ}\text{F} \\
 8\text{AM} \quad -3^{\circ}\text{F} \\
 \underline{-7^{\circ}\text{F}} \quad \left. \begin{array}{l} \uparrow \\ \uparrow \end{array} \right\} +7^{\circ}\text{F} \\
 9\text{AM} \quad -10^{\circ}\text{F}
 \end{array}$$

$$\boxed{+18^{\circ}\text{F}} \text{ AT } 5\text{AM}$$

c. In answering part (b), Josiah and Kate used different methods. Josiah said his method involved multiplication, while Kate said she did not use multiplication. Both students arrived at the correct answer. How is this possible? Explain.

MULTIPLICATION IS THE SAME  
AS REPEATED ADDITION.

Challenge Question:

Michael's father bought him a 16-foot board to cut into shelves for his bedroom. Michael plans to cut the board into 11 equal size lengths for his shelves.

a. The saw blade that Michael will use to cut the board will change the length of the board by  $-0.125$  inches for each cut. How will this affect the total length of the board?

11 equal sizes = 10 cuts

$$\begin{array}{r} -0.125'' \\ \times 10 \\ \hline -1.25'' \end{array}$$

$$\begin{array}{r} 16' \\ \times 12''/\text{foot} \\ \hline 32 \\ 160 \\ \hline 192'' \end{array}$$

$$\begin{array}{r} 192.00'' \\ - 1.25'' \\ \hline 190.75'' \end{array}$$

190.75 inches  
~~per board~~  
per board

b. After making his cuts, what will the exact length of each shelf be?

$$\begin{array}{r} 17.3409 \\ 11 \overline{) 190.7500} \\ \underline{-11} \downarrow \\ 80 \\ \underline{-77} \downarrow \\ 37 \\ \underline{-33} \downarrow \\ 45 \\ \underline{-44} \\ 100 \\ \underline{99} \end{array}$$

17.34" per board