3.3: Solving Equations Using Addition and Subtraction

*Consider:*

You have 7 less points than your cousin. Your brother has 8 more points than your sister.

Write an expression to model each situation.
Use  as your variable. Can each expression
be written in more than one way? Explain.

*Review Skills:*

Add.

 1.  2.  3. 

Subtract.

 4.  5.  6. 

Definitions:

Equivalent Equations: **Equations that have the same solution**

2+4 =6 x+2 =5; x=3 n=5; 15 – 10 =n

4+2=6 7- 4=x; x=3 a=5; 10-a=5

Addition Property of Equality: **Adding the same term to both sides of an equation.**

Subtraction Property of Equality: **Subtract the same term to both sides of an equation.**

 How are inverse operations used to solve equations?

*Lesson Examples:*

Solve the equation. Check your solution.

 1.  2. 

 3.  4. 

 5.  6. 

7. $x-\frac{5}{6}=-\frac{1}{6}$ 8. 8 – z = -3

9. $-2\frac{1}{4}=x-\frac{4}{5}$ 10. $\frac{1}{2}=\frac{2}{3}+n$

You Be the Teacher

In Exercises 1 and 2, use the student solutions below.

 Karen



Courtney



 1. Did both students get a correct solution?

 2. Is one student’s answer more complete? If so, which one? Explain.

 3. A student asks you how to solve  Describe your explanation and any math steps you would show.

 4. Describe Mario’s solution. Did he get the correct answers? Explain.

 Mario



 5. Kelly looks at Mario’s solutions and does not understand why  is
a solution. She thought absolute value could not be negative. Explain Kelly’s error.

 6. Pat says the solutions of  are  and  What mistake did Pat make? Explain.

 7. A student asks you if every absolute value equation has two solutions. How would you respond? Explain.

 8. Give an example of an absolute value equation with (a) one solution,
(b) two solutions, and (c) no solutions.