Problem Set

1. Given that $2x + 7 = 27$ and $3x + 1 = 28$, does $2x + 7 = 3x + 1$? Explain.

2. Is -5 a solution to the equation $6x + 5 = 5x + 8 + 2x$? Explain.

$6 \cdot -5 + 5 = 5 \cdot -5 + 8 + 2 \cdot -5$

$-30 + 5 = -25 + 8 + -10$

$-25 = -17 + -10$

$-25 = -27$

No

3. Does $x = 1.6$ satisfy the equation $6 - 4x = -\frac{x}{4}$? Explain.

PEMDAS

$6 - 4(1.6) = -\frac{1.6}{4}$

$6 - 6.4 = -.4$

$-.4 = -.4$

Yes!

4. Use the linear equation $3(x+1) = 3x+3$ to answer parts (a)–(d).

a. Does $x = 5$ satisfy the equation above? Explain.

Yes!

b. Is $x = -8$ a solution of the equation above? Explain.

$3(-8+1) = 3(-8)+3$

$3(-7) = -24+3$

$-21 = -21$

Yes!

c. Is $x = \frac{1}{2}$ a solution of the equation above? Explain.

$3(.5+1) = 3(.5)+3$

$3(1.5) = 1.5+3$

$4.5 = 4.5$

Yes!

What interesting fact about the equation $3(x+1) = 3x+3$ is illuminated by the answers to parts (a), (b), and (c)? Why do you think this is true?

Any # works! This statement is always true.

$3(x+1) = 3x+3$

$3x+3 = 3x+3$

Lesson 4: Solving a Linear Equation

Classwork

Exercises

For each problem, show your work, and check that your solution is correct.

1. Solve the linear equation $x+x+2+x+4+x+6=-28$. State the property that justifies your first step and why you chose it.

$4x+12=-28$

$-12 \quad -12$ ← Subtraction Property of equality b/c opposite of addition

$\frac{4x}{4}=\frac{-40}{4}$

$x=-10$

CHECK

$x+x+2+x+4+x+6=-28$

$-10+-10+2+-10+4+-10+6=-28$

$-28=-28$

2. Solve the linear equation $2(3x + 2) = 2x - 1 + x$. State the property that justifies your first step and why you chose it.

$2(3(-\frac{5}{3})+2)=2(-\frac{5}{3})-1+-\frac{5}{3}$ ✓

$2(3x+2)=2x-1+x$

$2(3x+2)=3x-1$

$6x+4=3x-1$

$-3x \quad -3x$

$3x+4=-1$

$-4 \quad -4$

$3x=-5$

$\frac{3x}{3}=\frac{-5}{3}$

$x=-\frac{5}{3}=-1.\overline{6}$

$3\overline{)5.0}$ $1.\overline{6}$

-3

2.0

-1.8

2

3. Solve the linear equation $x - 9 = \frac{3}{5}x$. State the property that justifies your first step and why you chose it.

① Isolate variable

$1x - 9 = \frac{3}{5}x$

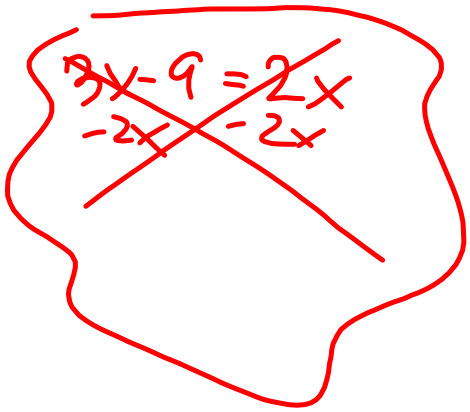
$-\frac{3}{5}x \quad -\frac{3}{5}x$

$\frac{2}{5}x - 9 = 0$

$+9 \quad +9$

$\frac{5}{2} \cdot \frac{2}{5}x = 9 \cdot \frac{5}{1}$

$x = \frac{45}{2}$



4. Solve the linear equation $29 - 3x = 5x + 5$. State the property that justifies your first step and why you chose it.

5. Solve the linear equation $\frac{1}{3}x - 5 + 171 = x$. State the property that justifies your first step and why you chose it.