Name: KEY

Solving Equations – Challenge Worksheet

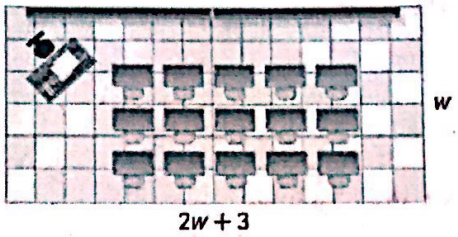
MP Persevere with Problems Solve $(x + 5)(x + 5) = 49$. (*Hint:* There are two solutions.) **(Use guess and check!)**

$x=2$ $(7)(7)=49$

or

$x=-12$ $(-7)(-7)=49$

MP Persevere with Problems A diagram of a room is shown. If the perimeter of the room is 78 feet, what is the area of the floor of the room? (Lesson 3)



$(2w+3)+w+(2w+3)+w=78$

$6w+6=78$

$6w=72$

$w=12$

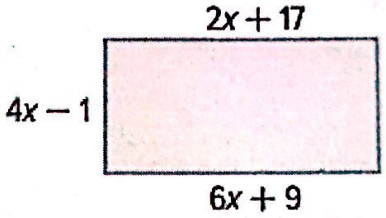
length $=2\cdot12+3$
$=27$

width $=12$

$27\cdot12=324$

$324\ ft^2$

MP Persevere with Problems Find the area of the rectangle at the right.



$2x+17=6x+9$

$17=4x+9$

$8=4x$

$2=x$

$2\cdot2+17=21$

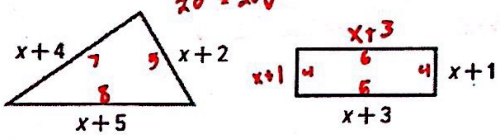
$4\cdot2-1=7$

$21\times7=147$

$147\ units^2$

MP Reason Abstractly Write an equation to find the value of x so that each pair of polygons has the same perimeter. Then solve.

20.



$20=20$ ✓

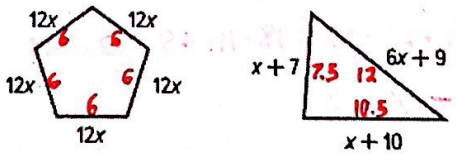
$(x+4)+(x+2)+(x+5)=(x+3)+(x+1)+(x+3)+(x+1)$

$3x+11=4x+8$

$11=x+8$

$3=x$

21.



$30=30$ ✓

$5(12x)=(x+7)+(6x+9)+(x+10)$

$60x=8x+26$

$52x=26$

$x=\frac{1}{2}$

You and your friend both bought some gum. Your friend spent three times as much as you did. Altogether, you spent $4.80. How much did you each spend on gum?

You $=x$

Friend $=3x$

$x+3x=4.80$

$4x=4.80$

$x=1.20$

You $=\$1.20$

Friend $=\$3.60$

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Solve each equation.

1) $4\frac{1}{3}x + 16 = 2\frac{2}{3}x + 21$

$\frac{13}{3}x + 16 = \frac{8}{3}x + 21$

$\frac{5}{3}x = 5$ · $\frac{3}{5}$

$x = 3$

2) $\frac{12}{4}x + 12 = \frac{3}{4}x + 8$

$12 = \frac{1}{4}x + 8$

$4 = \frac{1}{4}x$

$x = 16$

3) $\frac{5}{6}x + 16 = -\frac{1}{4}x - 10$

$\frac{10}{12}x + 16 = -\frac{3}{12}x - 10$

$\frac{13}{12}x + 16 = -10$

$\frac{13}{12}x = -26$ · $\frac{12}{13}$

$x = -24$

4) $\frac{1}{3}x + \frac{7}{6} = \frac{3}{4}x + \frac{2}{8}$ ×24 → $8x + 28 = 18x + 6$

$\frac{24}{12}x + \frac{7}{6} = \frac{9}{12}x + \frac{2}{8}$

$22 = 10x$

$2.2 = x$

$\frac{7}{6} = \frac{5}{12}x + \frac{2}{8}$

$\frac{28}{24} = \frac{5}{12}x + \frac{6}{24}$

$\frac{12}{5}$ · $\frac{22}{24} = \frac{5}{12}x$ · $\frac{12}{5}$

$\frac{22}{10} = x$

$x = \frac{11}{5}$ or $2\frac{1}{5}$ or 2.2

5) $8(x - 2) + 3(2x + 3) = 3(x - 6)$

$8x - 16 + 6x + 9 = 3x - 18$

$14x - 7 = 3x - 18$

$11x - 7 = -18$

$11x = -11$

$x = -1$

6) $4 - 2x - 6x + 3 = 3x + 12 - 11x$

$7 - 8x = -8x + 12$

$7 = 12$

No Solution

7) $-3(2x - 5) + 7x - 14 + x - 4 + 2(10 + 2x) = 18 - 11x + 4(2 - x + 4x) - 0.5x + \frac{1}{2}x - 19$ (2+3x)

$-6x + 15 + 7x - 14 + x - 4 + 20 + 4x = 18 - 11x + 8 + 12x - 19$

$6x + 17 = x + 7$

$5x = -10$

$x = -2$

I am thinking of a number. If I multiply that number by four, or divide that number by four, or add four to that number, or subtract four from that number, I would get four new numbers. When I add those four new numbers together, I get 400. What number am I thinking of? (For example, if I was thinking of the number 12, my four new numbers would be 48, 3, 16, and 8. The sum of those is 75. So 12 is not my number.)

$4x + \frac{x}{4} + (x+4) + (x-4) = 400$

$6\frac{1}{4}x = 400$

$\frac{25}{4}x = 400$

$x = 64$

$400 \cdot \frac{4}{25}$ (16)

$256 + 16 + 68 + 60$

$272 + 128$

400