

1. Find two consecutive integers whose sum is  $-17$ .

Let 1<sup>st</sup> CI =  $x = -9$

2<sup>nd</sup> CI =  $x+1 = -8$

Equation:  $x + x + 1 = -17$



2. Find three consecutive even integers such that the sum of the smallest and twice the second is 20 less than the third.

Let 1<sup>st</sup> CEI =  $x = -10$

2<sup>nd</sup> CEI =  $x+2 = -10+2 = -8$

3<sup>rd</sup> CEI =  $x+4 = -10+4 = -6$

Equation:  $x + 2(x+2) = (x+4) - 20$



3. Find two consecutive odd integers such that 4 times the larger is 29 more than 3 times the smaller.

Let 1<sup>st</sup> COI =  $x = 21$

2<sup>nd</sup> COI =  $x+2 = 23$

Equation:  $4(x+2) = 3x + 29$



4. The second of three numbers is 8 more than the first, and the third number is 3 less than 3 times the first. If the third number is 15 more than the second, find the three numbers.

Let 1<sup>st</sup> # =  $x = 13$

2<sup>nd</sup> # =  $x+8 = 13+8 = 21$

3<sup>rd</sup> # =  $3x-3 = 3(13)-3 = 36$

Equation:  $3x-3 = (x+8) + 15$



5. The greater of two numbers is 1 more than twice the smaller. Three times the greater exceeds 5 times the smaller by 10. Find the numbers.

Let smaller # =  $x = 7$

greater # =  $2x+1 = 2(7)+1 = 15$

Equation:  $3(2x+1) = 5x + 10$



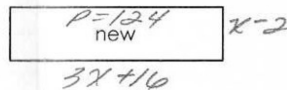
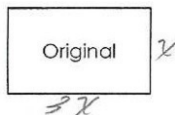
6. The length of a rectangle is 3 times its width. The perimeter of the rectangle is 72 centimeters. Find the dimensions of the rectangle.

$P=72$   $x$   $P=2l+2w$   
 $3x$



Equation:  $72 = 2(3x) + 2x$

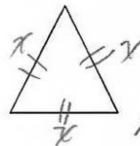
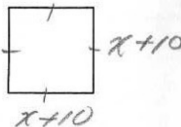
7. The length of a rectangle is three times the width. If the length is increased by 16 inches and the width is decreased by 2 inch, a new rectangle is formed whose perimeter is 124 inches. Find the dimensions of the original rectangle.



Equation:  $124 = 2(3x+16) + 2(x-2)$   
 $P=2l+2w$

8. A side of a square is 10 meters longer than the side of an equilateral triangle. The perimeter of the square is 3 times the perimeter of the triangle. Find the length of each side of the triangle.

$P_{\square} = 4s$   
 $= 4(x+10)$   
perimeter of sq.



$P_{\triangle} = 3x$   
perimeter of  $\triangle$



Equation:  $4(x+10) = 3(3x)$

9. Solve for x:

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

10. Solve for w:

$0.03w + 1.2 = 9.2 + 0.43w$

# What's the Problem Activity

$$\begin{array}{r}
 1.) \quad x + x + 1 = -17 \\
 2x + 1 = -17 \\
 \quad -1 \quad -1 \\
 \hline
 2x = -18 \\
 \frac{2x}{2} = \frac{-18}{2}
 \end{array}$$

$x = -9$   
 ans: -9, -8

$$\begin{array}{r}
 5.) \quad 3(2x + 1) = 5x + 10 \\
 6x + 3 = 5x + 10 \\
 -5x \quad -5x \\
 \hline
 x + 3 = 10 \\
 \quad -3 \quad -3 \\
 \hline
 x = 7
 \end{array}$$

$x = 7$   
 ans: 7, 15

$$\begin{array}{r}
 2.) \quad x + 2(x + 2) = (x + 4) - 20 \\
 x + 2x + 4 = x - 16 \\
 3x + 4 = x - 16 \\
 -x \quad -x \\
 \hline
 2x + 4 = -16 \\
 \quad -4 \quad -4 \\
 \hline
 2x = -20 \\
 \frac{2x}{2} = \frac{-20}{2}
 \end{array}$$

$x = -10$   
 ans: -10, -8, -6

$$\begin{array}{r}
 6.) \quad 72 = 2(3x) + 2x \\
 72 = 6x + 2x \\
 72 = 8x
 \end{array}$$

$9 = x$   
 ans: width = 9 cm  
 length =  $3(9) = 27$  cm

$$\begin{array}{r}
 3.) \quad 4(x + 2) = 3x + 29 \\
 4x + 8 = 3x + 29 \\
 -3x \quad -3x \\
 \hline
 x + 8 = 29 \\
 \quad -8 \quad -8 \\
 \hline
 x = 21
 \end{array}$$

$x = 21$   
 ans: 21, 23

$$\begin{array}{r}
 7.) \quad 124 = 2(3x + 16) + 2(x - 2) \\
 124 = 6x + 32 + 2x - 4 \\
 124 = 8x + 28 \\
 -28 \quad -28 \\
 \hline
 96 = 8x
 \end{array}$$

$12 = x$   
 original  
 width = 12 in  
 length =  $3(12) = 36$  in

$$\begin{array}{r}
 4.) \quad 3x - 3 = (x + 8) + 15 \\
 3x - 3 = x + 23 \\
 -x \quad -x \\
 \hline
 2x - 3 = 23 \\
 \quad +3 \quad +3 \\
 \hline
 2x = 26 \\
 \frac{2x}{2} = \frac{26}{2}
 \end{array}$$

$x = 13$   
 ans: 13, 21, 36



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8.)  $P_{\square} = 3(P_{\Delta})$   
 $4(x+10) = 3(3x)$   
 $4x+40 = 9x$   
 $\begin{array}{r} 4x+40=9x \\ -4x \quad -4x \\ \hline 40 = 5x \\ \frac{40}{5} = \frac{5x}{5} \\ 8 = x \end{array}$

ans: length of each  $\Delta = 8$  m

9.)  $3(3x+1) + 3x = 4(2x-1) + 4x$   
 $9x+3+3x = 8x-4+4x$   
 $\begin{array}{r} 12x+3 = 12x-4 \\ -12x \quad -12x \\ \hline 3 = -4 \end{array}$   
 $3 \neq -4$   
 no solution

10.)  $100[0.03W + 1.2 = 9.2 + 0.43W]$

$$\begin{array}{r} 3W + 120 = 920 + 43W \\ -3W \quad -3W \\ \hline 120 = 920 + 40W \\ -920 \quad -920 \\ \hline 800 = 40W \\ \frac{800}{40} = \frac{40W}{40} \\ 20 = W \end{array}$$

20 = W