

Name: _____
 Date: _____
 Class: _____

Algebra
 Unit 8
 HW 8-4

- 1) The product of two consecutive positive even integers is 14 more than their sum. Set up an equation that can be used to find the two numbers and solve it.

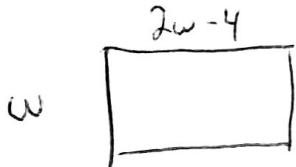
$x \rightarrow 1^{st}$ cons pos int
 $x+2 \rightarrow 2^{nd}$ cons pos int

$$\begin{aligned} x(x+2) &= x+x+2+14 \\ x^2+2x &= 2x+16 \\ -2x-16 & \quad -2x-16 \\ \hline x^2-16 &= 0 \\ +16 & \quad +16 \\ \hline \sqrt{x^2-16} &= \sqrt{16} \end{aligned}$$

$x = \pm 8$
 $x = 8$

$\boxed{8, 10}$

- 2) The length of a rectangle is 4 less than twice the width. The area of the rectangle is 70 square feet. Find the width, w , of the rectangle algebraically. Explain why one of the solutions for w is not viable.



$$\begin{aligned} w(2w-4) &= 70 \\ 2w^2-4w &= 70 \\ -70 & \quad -70 \\ \hline 2w^2-4w-70 &= 0 \end{aligned}$$

LCF
 $\frac{2}{2}$

$$\frac{2w^2-4w-70}{2} = 0$$

$$2(w^2-2w-35) = 0$$

$$2(w-7)(w+5) = 0$$

~~$w-7=0$~~ $w+5=0$
 $\boxed{w=7}$ ~~$w=-5$~~

-5 is not a solution b/c it would give negative side lengths

- 3) Two sets of three consecutive integers have a property that the product of the larger two is one less than seven times the smallest. Set up and solve an equation that can be used to find both sets of integers.

$x \rightarrow 1^{st}$ cons int
 $x+1 \rightarrow 2^{nd}$
 $x+2 \rightarrow 3^{rd}$

$$\begin{aligned} (x+1)(x+2) &= 7x-1 \\ x^2+x+2x+2 &= 7x-1 \\ -7x+1 & \quad -7x+1 \\ \hline x^2-4x+3 &= 0 \\ (x-3)(x-1) &= 0 \\ \underline{x=3} \quad \underline{x=1} \end{aligned}$$

$\boxed{\begin{array}{c} 1, 2, 3 \\ 3, 4, 5 \end{array}}$

4) Solve: $\frac{66}{1} = \frac{n(n-1)}{2}$

$$66(2) = n(n-1)$$

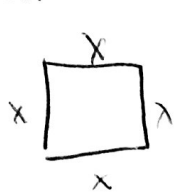
$$\begin{aligned} 132 &= n^2-n \\ -132 & \quad -132 \\ \hline 0 &= n^2-n-132 \end{aligned}$$

$$0 = n^2 - n - 132$$

$$0 = (n-12)(n+11)$$

$\underline{n=12}$ $\underline{n=-11}$

5) If the area of a square is 28 less than 4 times its perimeter, how long is a side of the square?



$$A \rightarrow x^2$$

$$P \rightarrow 4x$$

$$x^2 = 4(4x) - 28$$

$$x^2 = 16x - 28$$

$$\begin{array}{r} -16x + 28 \\ \hline \end{array}$$

$$x^2 - 16x + 28 = 0$$

$$(x-14)(x-2) = 0$$

$$x = 14 \quad x = 2$$

could be either answer

6) If two consecutive integers have a product that is 8 less than 10 times the smaller, what possible integers could you have?

$x \rightarrow$ 1st cons int

$x+1 \rightarrow$ 2nd

$$x(x+1) = 10x - 8$$

$$x^2 + x = 10x - 8$$

$$\begin{array}{r} -10x + 8 \\ \hline \end{array}$$

~~$$x^2 - 9x + 8 = 0$$~~

$$x^2 - 9x + 8 = 0$$

$$(x-8)(x-1) = 0$$

$$x = 8 \text{ or } x = 1$$

$$\boxed{8, 9} \text{ or } \boxed{1, 2}$$

7) Solve: $x^2 = \cancel{27}x - 198$

$$\begin{array}{r} -29x \\ +29x + 198 \\ \hline \end{array}$$

$$x^2 + 29x + 198 = 0$$

$$(x+11)(x+18) = 0$$

$$\boxed{x = -11} \quad \boxed{x = -18}$$

8) Solve: $x^2 - 256 = 0$

~~$$(x-16)(x+16) = 0$$~~

$$\underline{x = 16} \quad \underline{x = -16}$$