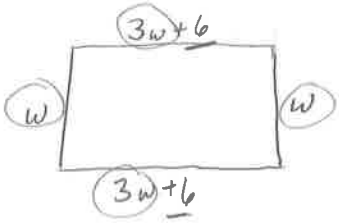
7.7B Factoring Application

w = width $3w+6$ = length



The length of a rectangle is 6 more than 3 times the width.

a) Write a polynomial to represent the perimeter of the rectangle.

$P = 8w + 12$

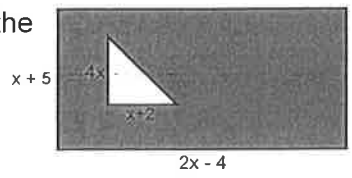
b) Write a polynomial to represent the area of the rectangle.

$A = l \cdot w$

$w(3w+6)$

$A = 3w^2 + 6w$

a) Find the area of the rectangle.



$A = (2x-4)(x+5)$

$2x^2 + 10x - 4x - 20$

$A = 2x^2 + 6x - 20$

b) Find the area of the triangle.

$A = \frac{1}{2}bh \longrightarrow \frac{1}{2}(4x)(x+2)$

$2x(x+2)$

$A = 2x^2 + 4x$

c) Find the area of the shaded region.

Area of rectangle − Area of triangle

$(2x^2 + 6x - 20) - (2x^2 + 4x)$

$2x^2 + 6x - 20 - 2x^2 - 4x$

$A = 2x - 20$ → area of shaded region

The length of a rectangular game reserve is 1 mile longer than twice the width. The area of the reserve is 55 square miles.

a) What is the width of the reserve? 5 miles

$A = 55$ sq. miles w

$2w+1$

$w(2w+1) = 55$

$2w^2 + w = 55$

$-55 \quad -55$

$2w^2 + w - 55 = 0$

$a \quad b \quad c$

	-110
1	110
2	55
5	22
-10	11

$(2w^2 - 10w) + (11w - 55)$

$2w(w-5) + 11(w-5)$

$(2w+11)(w-5)$

$2w+11 = 0 \quad w-5 = 0$

$-11 \quad -11 \quad +5 \quad +5$

$\frac{2w}{2} = \frac{-11}{2} \quad w = 5$ miles

$w = -5.5$

b) What if the area of the reserve is 136 square miles. How wide is the reserve?

The area of a rectangle is represented by the polynomial $3y^3 + 15y^2 - 27y$ square units. If the width of the rectangle is 3y, find the length.

$A = 3y^3 + 15y^2 - 27y$

$3y$ GCF $(y^2 + 5y - 9)$

$3y$: width; $(y^2 + 5y - 9)$: length

9
-1 | -9
-3 | -3

Your new hot tub is the shape of a square. The area of your hot tub is represented by the polynomial $x^2 - 6x + 9$ square units.

a) Write the polynomial that represents the side lengths of your hot tub.

$A = x^2 - 6x + 9$

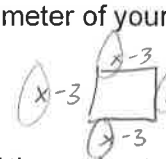
$(x^2 - 3x)(3x + 9)$

$x(x-3) - 3(x-3)$

$(x-3)(x-3)$

$s = x - 3$

b) Write the polynomial that represents the perimeter of your hot tub.



$P = 4x - 12$

c) If the perimeter of your hot tub is 20 feet, find x.

$4x - 12 = 20$

$+12 \quad +12$

$\frac{4x}{4} = \frac{32}{4}$

$x = 8$ feet

Homework

WS 7.7B Application Practice

#1, 3, 5