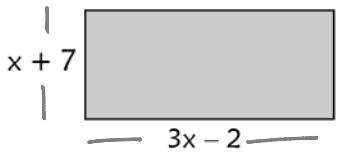
9.2 Applications

Name: key

Example 1: Write a simplified polynomial that represents the **AREA** of the shaded region.

Note: Diagrams are not drawn to scale.

a)



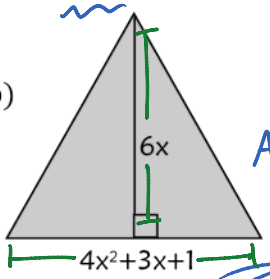
$A = l \cdot w$

$A = (3x-2)(x+7)$

$= 3x^2 + 21x - 2x - 14$

$= 3x^2 + 19x - 14$ units^2

b)



$A = \frac{1}{2}bw$

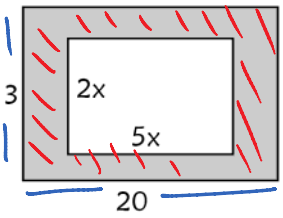
$A = \frac{1}{2}(4x^2+3x+1)(6x)$

$= \frac{1}{2}(24x^3 + 18x^2 + 6x)$

$= 12x^3 + 9x^2 + 3x$

Example 2: Write a simplified polynomial for the **AREA** of the shaded region only.

a)



$A = bh$

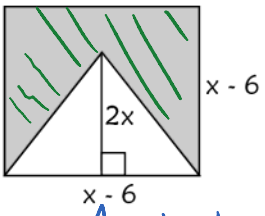
$-10x^2 + 60$

$A_{BIG} - A_{LITTLE}$

$(20)(3) - (2x)(5x)$

$60 - 10x^2$

b)



$A_{Rectangle} - A_{Triangle}$

$(x-6)(x-6) - \frac{1}{2}(x-6)(2x)$

$x^2 - 12x + 36 - \frac{1}{2}(2x^2 - 12x)$

$x^2 - 12x + 36 - x^2 + 6x$

$-6x + 36$

Example 3: Try a real life example!

You are designing a picture frame to surround a rectangular picture with dimensions 20 inches by 22 inches. The width of the frame around the picture is the same on every side.

a) Write a polynomial that represents the total **PERIMETER** of the picture frame.

$P = (2x+22) + (2x+22) + (2x+20) + (2x+20)$

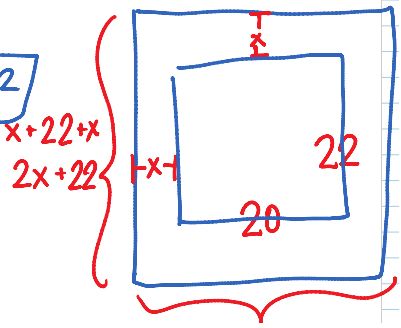
$P = 8x + 84$ inches

b) Write a polynomial that represents the total **AREA** of the picture frame.

$A = (2x+22)(2x+20)$

$A = 4x^2 + 40x + 44x + 440$

$A = 4x^2 + 84x + 440$ in^2



c) Find the **AREA** of the picture frame when the width of the frame is 4 inches.

$2(4) + 22$ $\quad$ $2(4) + 20$

$2(4)+22$
30

$2(4)+20$
28

$A=(30)(28)$
$=840in^2$

$x+20+x$
$2x+20$

Example 3: Try a real life example!
You are designing a picture frame to surround a rectangular picture with dimensions 20 inches by 22 inches. The width of the frame around the picture is the same on every side.

a) Write a polynomial that represents the total **PERIMETER** of the picture frame.

b) Write a polynomial that represents the total **AREA** of the picture frame.

c) Find the **AREA** of the picture frame when the width of the frame is 4 inches.