Algebra 1 | Unit 7: Quadratic Expressions | Practice

Day 4 – Applications of Polynomials

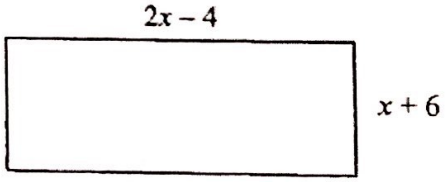
Name: Key

Practice Assignment

Date: _____ **Block:** _____

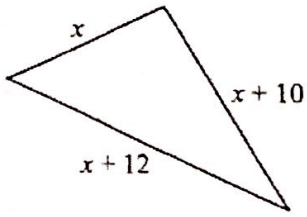
1. Find the perimeter of the following figures:

a.



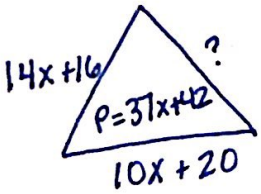
$P = 2x - 4$
$2x - 4$
$x + 6$
$x + 6$
$\boxed{P = 6x + 4}$

b.



$P = x$
$x + 12$
$x + 10$
$\boxed{P = 3x + 22}$

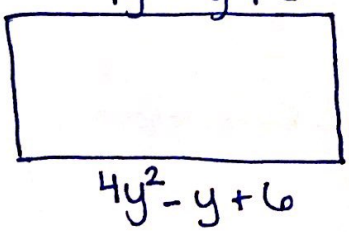
2. The measure of the perimeter of a triangle is 37x + 42. It is known that two of the sides of the triangle have measures of 14x + 16 and 10x + 20. Find the length of the third side.



$14x + 16$
$+ 10x + 20$
$24x + 36$

$37x + 42$
$+ (-24x + -36)$
$\boxed{13x + 6}$

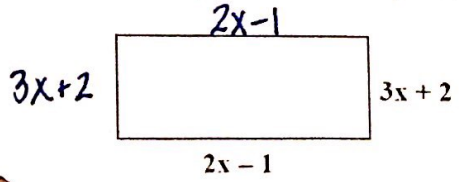
3. A rectangle has a perimeter of $12y^2 - 2y + 18$ and has a width of $4y^2 - y + 6$. What is the length of the rectangle?



$12y^2 - 2y + 18$
$+ (-8y^2 + 2y + 12)$ both widths
$4y^2 + 6$ both lengths

so 1 length is $2y^2 + 3$.

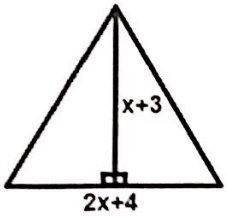
4. Write an expression for the perimeter and area of the following rectangle.



$P = 2x - 1$
$3x + 2$
$2x - 1$
$+ 3x + 2$
$\boxed{P = 10x + 2}$

$A = l \cdot w$
$= (2x - 1)(3x + 2)$
$= 6x^2 + 4x - 3x - 2$
$\boxed{A = 6x^2 + x - 2}$

5. Write an expression for the area of the triangle ($A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$).



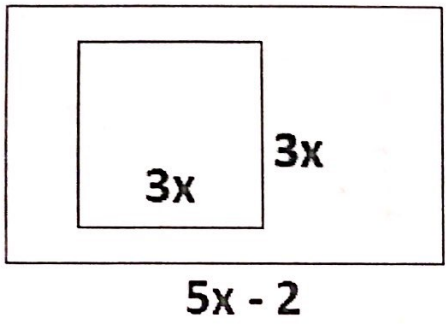
$A = \frac{1}{2}(x+3)(2x+4)$

$A = \frac{1}{2}(2x^2+4x+6x+12)$

$A = \frac{1}{2}(2x^2+10x+12)$

$\boxed{A = x^2+5x+6}$

6. Find the area of the shaded region:



Big − Little

$4x(5x-2) - 3x(3x)$

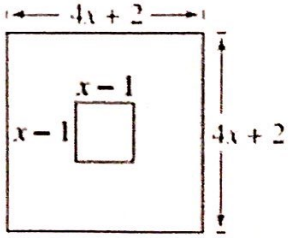
$(20x^2-8x) - (9x^2)$

$20x^2-8x$

$+ \; -9x^2$

$\boxed{11x^2-8x}$

7. Find the area of the shaded region:



Big − Little

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

$(16x^2+8x+8x+4) - (x^2-x-x+1)$

$(16x^2+16x+4) - (x^2-2x+1)$

$16x^2+16x+4$

$+ \; (-x^2+2x+1)$

$\boxed{15x^2+18x+3}$

8. The polynomial $c(x) = x^2 + 4x - 10$ models the cost a company incurs from making an item at a price x. The polynomial $i(x) = 4x^2 - x + 20$ represents the income from selling the same item at a price x. Write a polynomial that expresses the profit from making and selling the item. (hint: profit = income – cost)

Income − Cost

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

$+ \; -x^2-4x+10$

$\boxed{P(x) = 3x^2-5x+30}$