Warm-Up November 30, 2018

1. What is the difference between the area and perimeter of the rectangle below?

$A = LW$ $P = 2L + 2W$

2x + 3

3x - 4

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

$6x^2 - 8x + 9x - 12$

$6x^2 + x - 12 - (10x - 2)$

$6x^2 + x - 12 - 10x + 2$

$\boxed{6x^2 - 9x - 10}$

2. Factor Completely: $\frac{5z^2}{5} + \frac{50z}{5} + \frac{125}{5}$

$5(z^2 + 10z + 25)$

$ac = 25$

1	25
5	5

$\boxed{5(z+5)(z+5) \quad 5(z+5)^2}$

3. Factor Completely: $\frac{81x^2}{9} - \frac{9y^2}{9}$

$9(9x^2 - y^2)$

$\boxed{9(3x+y)(3x-y)}$

Application

Find the length and width.

1. $A = 10x^3y^4 + 30xy$

$$\frac{10x^3y^4}{10xy} + \frac{30xy}{10xy}$$

$$A = \underbrace{10xy}_{L}\underbrace{(x^2y^3+3)}_{W}$$

2. $A = 25c^2 - 1$

$(5c+1) = L$

$(5c-1) = W$

3. $A = x^2 - 7x - 8$

$ac = -8$

-1	8
-2	4
1	-8
2	-4

$$\underbrace{(x+1)}_{L}\underbrace{(x-8)}_{W}$$

4. $A = 2x^2 - 6x + 7x - 21$

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

$$\underbrace{(2x+7)}_{L}\underbrace{(x-3)}_{W}$$

L = · W

The length of Morgan's room is three times the width of her room. After some remodeling the area of Morgan's room is given by the trinomial $3w^2 + 8w + 4$ sq.ft. Find the increase in the dimensions of the room. (Hint: Factor $3w^2 + 8w + 4$ and compare the dimensions with the original.)

A

$L = 3w$

$W = w$

$A = 3w^2 + 8w + 4$

$(3w^2 + 2w)(+6w + 4)$

$w \quad w \quad 2 \quad 2$

$w(3w+2) + 2(3w+2)$

$(w+2)(3w+2)$

$\boxed{2 \text{ ft.}}$

$ac = 12$

1	12
2	6
3	4

$A = LW$ $\qquad$ $= 2L + 2W$

The area of a rectangular plastic sheet is given by $b^3 + b^2 + 4b + 4$ square inches. Find an expression for the perimeter of the sheet. (Hint : Factor $b^3 + b^2 + 4b + 4$ to find the length and width of the sheet. Use the perimeter formula for a rectangle, $P = 2L + 2W$).

$$(b^3 + b^2 + 4b + 4)$$

$$b^2(b+1) + 4(b+1)$$

$$\underbrace{(b^2+4)}_{L}\underbrace{(b+1)}_{W}$$

$$2(b^2+4) + 2(b+1)$$

$$2b^2 + 8 + 2b + 2$$

$$\boxed{P = 2b^2 + 2b + 10}$$

A square parking area has an area equal to $36x^2 - 36x + 9$ meters. Find the side of the parking lot.

$$9(4x^2 - 4x + 1)$$

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

$$2x(2x-1) - 1(2x-1)$$

$$9(2x-1)(2x-1)$$

$$S = 2x - 1$$

The length of a rectangular courtyard is given by the expression 2x -3. If the area is given by, $2x^2 + 5x - 12$, find the width of the room. (Hint: Factor the expression given for area.)

$$\left(\frac{2x^2}{2x} + \frac{8x}{2x}\right)\left(\frac{-3x}{-3} - \frac{12}{-3}\right)$$

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

$$(2x-3)\underbrace{(x+4)}_{W}$$

The volume of a rectangular prism is $15x^3 + 70x^2 + 40x$. What are the possible dimensions of the prism? V = lwh

$$\frac{15x^3}{5x} + \frac{70x^2}{5x} + \frac{40x}{5x}$$

$$5x(3x^2 + 14x + 8)$$

$$\left(\frac{3x^2}{3x} + \frac{12x}{3x}\right)\left(+\frac{2x}{2} + \frac{8}{2}\right)$$

$$3x(x+4) + 2(x+4)$$

$$\underbrace{5x}_{L}\,\underbrace{(3x+2)}_{W}\,\underbrace{(x+4)}_{H}$$

Study Guide Questions

$$\frac{73+87+81+97+n}{5}=86$$

$$\frac{338+n}{5}=86$$

n = score on fifth test

$$338+n=430$$

$$n=92$$

#24 $f(x)=200x+7000$

$\downarrow$ \$ per ft.

$b(x)=260x$

$\downarrow$ \$ per ft.

ft	\$\$
100	26000
120	31200
180	46800
250	65000

+20, +60, +70

+5200, +15600, +18200

$$y-26000=260(x-100)$$

$$y-26000=260x-26000$$

$$+26000 \qquad +26000$$

$$y=260x$$

#25 $(2, 4.3)\ (4.5, 7.8)$

$$m=\frac{7.8-4.5}{4.5-2}=\frac{3.3}{2.5}=1.4 \text{ ft per hour}$$

$$1.4\frac{ft}{\cancel{hr}}\cdot 1.5\,\cancel{hr}=2.1\text{ ft.}$$

$$7.8+2.1=9.9\text{ ft.}$$