WARM-UP

1. Find the **axis of symmetry**:

$$y = 2x^2 + 4x - 5$$

$$x = \frac{-b}{2a} = \frac{-4}{2(2)} = \frac{-4}{4}$$

$$\boxed{x = -1}$$

2. Find the **y-intercept**:

$$f(x) = -5x^2 + 7x - 3$$

$$f(0) = 5(0)^2 + 7(0) - 3$$

$$= 0 + 0 - 3$$

$$= -3$$

$$\boxed{(0, -3)}$$

3. Find the **prime factors** of:

75

15 5

3 5

$$\boxed{3 \cdot 5 \cdot 5}$$

4. Find the **prime factors** of:

$$75xy^2$$

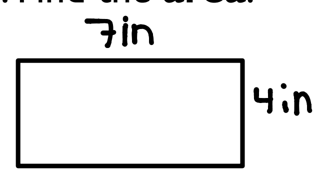
$$\boxed{3 \cdot 5 \cdot 5 \cdot x \cdot y \cdot y}$$

5. Simplify:

$$\frac{16 \div 16}{64 \div 16}$$

$$\boxed{\frac{1}{4}}$$

6. Find the **area**:



$$\boxed{28\,\text{in}^2}$$

FOIL

FIND EACH PRODUCT.

a. $3(2x - 4) = \boxed{6x - 12}$

b. $-4(x + 2) = \boxed{-4x - 8}$

c. $6x(5x - 1) = \boxed{30x^2 - 6x}$

FIND EACH PRODUCT.

1. $7(x^2 - 2) = \boxed{7x^2 - 14}$

2. $2x(-12x - 3) = \boxed{-24x^2 - 6x}$

3. $-5(x^2 + 3x - 2) = \boxed{-5x^2 - 15x + 10}$

- When multiplying a binomial times a binomial, we must distribute both terms of the first expression.

- “FOIL” is an acronym that keeps things organized when multiplying binomials.

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

- **First**
- **Outer**
- **Inner**
- **Last**

$$x \cdot 2x = 2x^2$$

$$x \cdot 5 = 5x$$

$$(-3) \cdot 2x = -6x$$

$$(-3) \cdot 5 = -15$$

Final answer: $\boxed{2x^2 - x - 15}$

PRACTICE

d. $(x-3)(x+5)$ $= x^2 + 5x - 3x - 15$

$= \boxed{x^2 + 2x - 15}$

e. $(3x-3)(x+1)$ $= 3x^2 + 3x - 3x - 3$

$= \boxed{3x^2 - 3}$

f. $(2x-3)(x-4)$ $= 2x^2 - 8x - 3x + 12$

$= \boxed{2x^2 - 11x + 12}$

FIND EACH PRODUCT BY FOILING:

1. $(3n+2)(n+3) = 3n^2 + 9n + 2n + 6$

$= \boxed{3n^2 + 11n + 6}$

2. $(x-4)(-x-7) = -x^2 - 7x + 4x + 28$

$= \boxed{-x^2 - 3x + 28}$

FIND EACH PRODUCT BY FOILING:

3. $(2x+3)(2x-3)$ $= 4x^2 - 6x + 6x - 9$
$= \boxed{4x^2 - 9}$

4. $(5x+6)(8x-4)$ $= 40x^2 - 20x + 48x - 24$
$40x^2 + 28x - 24$

5. $(4-x)^2$ $= (4-x)(4-x) = 16 - 4x - 4x + x^2$
$= \boxed{x^2 - 8x + 16}$

6. $(-x+2)(5-2x)$ $= -5x + 2x^2 + 10 - 4x$
$= 2x^2 - 9x + 10$

Factoring does the opposite of FOIL. Instead of expanding a polynomial it breaks it down into its smallest parts.

GCF: Greatest Common Factor

The greatest whole number that divides each term exactly, or the largest number that all the terms share.

FIND THE GCF OF THESE TERMS.

h. $8w^4$ and $5w^2$

4 2

2 2 $w \cdot w \cdot w \cdot w$

5 $w \cdot w$

$1 \, w \cdot w$

$= \boxed{w^2}$

i. $14x^2$ and -49 and $+77x$

2 7

$x \cdot x$

-7 7

7 11 x

$\boxed{7}$

FIND THE GCF OF THE FOLLOWING #'S:

1. $7y^5$ and $2y^2$

$\boxed{1y^2}$

2. $16y^3$, $-24y^6$, and $48y$

16: 8, 2; 8: 2, 4; 4: 2, 2

24: 6, 4; 6: 3, 2; 4: 2, 2

48: 6, 8; 6: 3, 2; 8: 4, 2; 4: 2, 2

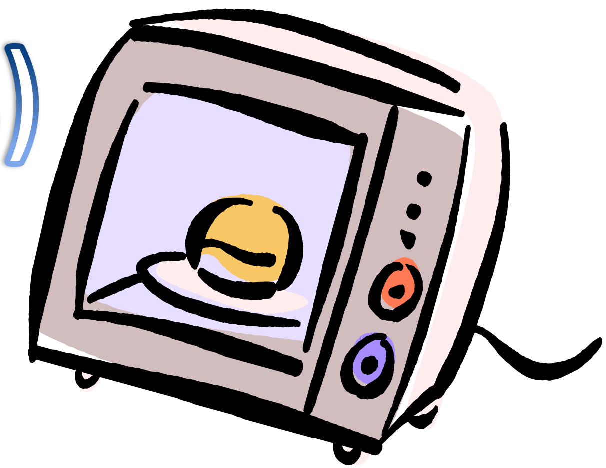
$= 2 \cdot 2 \cdot 2$

$= \boxed{8y}$

TO FACTOR OUT THE GCF:

- Write the GCF before the parentheses and write the leftovers inside the parentheses.

GCF(Leftovers)



FACTOR. (HINT: LOOK FOR THE GCF.)

GCF: 5

j. $\frac{15x^2}{5} - \frac{5}{5}$

$\boxed{5(3x^2-1)}$

k. $\frac{-8x^4}{-8x^2} - \frac{32x^3}{-8x^2} - \frac{16x^2}{-8x^2}$ GCF: $-8x^2$

$\boxed{-8x^2(x^2+4x+2)}$

l. $\frac{5x^5}{5x^3} + \frac{10x^4}{5x^3} + \frac{15x^3}{5x^3}$ GCF: $5x^3$

$\boxed{5x^3(1x^2+2x+3)}$

FACTOR. (HINT: LOOK FOR THE GCF.)

1. $\underset{5x^3}{\underline{10x^3}} - \underset{5x^3}{\underline{15x^4}} = \boxed{5x^3(2-3x)}$

2. $-22x + 11x^4 = \boxed{-11x(2-x^3)}$

$11x(-2+x^3)$

3. $-12y^5 - 14y^2 + 8y = \boxed{-2y(6y^4+7y-4)}$

$2y(-6y^4-7y+4)$

4. $x^3 - 2x^2 + x$ $\boxed{x(x^2-2x+1)}$

MIXED PRACTICE:

5. $(x-2)(x+1) = x^2 + x - 2x - 2$

$= \boxed{x^2 - x - 2}$

6. $5x + 5$ $\boxed{5(x+1)}$

7. $\dfrac{-13z^4}{-13z^3} - \dfrac{26z^5}{-13z^3} + \dfrac{13z^3}{-13z^3}$ $\boxed{-13z^3(z + 2z^2 - 1)}$

8. $-2x - 10x^6 - 4x^2$ $\boxed{-2x(1 + 5x^5 + 2x)}$