

Definitions:

- **Factor:** If a integer  $a$  is divisible by an integer  $b$ , then  $b$  is a factor of  $a$ .
- **Greatest Common Factor (GCF) of  $a$  and  $b$ :** is the largest common factor of  $a$  and  $b$ .

Important Properties:

- The exponent on a variable in the GCF is the smallest exponent that appears on that variable in all terms listed. For example, the GCF for  $2x^2y^2$ ,  $3x^3y$ , and  $4x^4y^3$  is  $x^2y$ .

**PROBLEMS**

Factor out the GCF for each problem.

1.  $6x^2 - 15x$

$$\boxed{\frac{6x^2 - 15x}{3x(2x - 5)}}$$


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2.  $-3x^3y - 9x^2$

$$\boxed{\frac{-3x^3y - 9x^2}{-3x^2(xy - 3)}}$$


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3.  $9x - 27y - 81$

$$\boxed{\frac{9x - 27y - 81}{9(x - 3y - 9)}}$$


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4.  $7x^3 + 14x^2$

$$\boxed{\frac{7x^3 + 14x^2}{7x^2(x + 2)}}$$

5.  $2x - 20y - 4y^2$

$$\boxed{\frac{2x - 20y - 4y^2}{2(x - 10y - 2y^2)}}$$


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6.  $-15x^5y^4 + 10x^3y^5$

$$\boxed{\frac{-15x^5y^4 + 10x^3y^5}{-5x^3y^4(3x^2 - 2y)}}$$

OR

$$\boxed{5x^3y^4(-3x^2 + 2y)}$$


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7.  $-40x^8y^7 - 16x^9y^5$

$$\boxed{\frac{-40x^8y^7 - 16x^9y^5}{-8x^8y^5(5y^2 + 2x)}}$$

8.  $4x^3y - 12x^2y^2 + 8x^2y$

$$\frac{4x^3y - 12x^2y^2 + 8x^2y}{4x^2y(x - 3y + 2)}$$

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9.  $18x^3y^3 - 12x^3y^2 + 6x^5y^2$

$$\frac{18x^3y^3 - 12x^3y^2 + 6x^5y^2}{6x^3y^2(3y - 2 + x^2)}$$

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10.  $16(x + 2) - x(x + 2)$

$$\frac{16(x + 2) - x(x + 2)}{(x + 2)(16 - x)}$$

11.  $3x(2x + 3) - 5(2x + 3)$

$$\frac{3x(2x + 3) - 5(2x + 3)}{(2x + 3)(3x - 5)}$$

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12.  $x(y + 3) - (y + 3)$

$$\frac{x(y + 3) - (y + 3)}{(y + 3)(x - 1)}$$

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13.  $3x^2(x + 3) - (x + 3)$

$$\frac{3x^2(x + 3) - (x + 3)}{(x + 3)(3x^2 - 1)}$$