

Multiply:

$$(-4x^2)(-3x) = (-4)(-3)(x^2 \cdot x) = 12x^3$$

Divide, leave answer in exponent form. Assume all variables in any denominator are non-zero:

Think of cancelling out 20b's top & bottom. 3 are left in bottom.

$$\frac{b^{20}}{b^{23}} = \frac{1}{b^3}$$

Same here: $\frac{-36}{72} = -\frac{1}{2}$ AND Cancel out 3 x's and 1 y.

$$\frac{-36x^3y^7}{72x^5y} = \frac{-y^6}{2x^2}$$

$$(a^3b)^4 = a^{12}b^4$$

$$(-2a^5)^4 = (-2)^4(a^5)^4 = 16a^{20}$$

$$(3x^5/y)^3 = \frac{3^3x^{15}}{y^3} = \frac{27x^{15}}{y^3}$$

Add:

$$(5x-11)+(-7x+34) = 5x-11-7x+34 = -2x+23$$

Multiply

$$2x^2(8x-5) = 16x^3-10x^2$$

$$(x-6)(x-5) = x^2-5x-6x+30 = x^2-11x+30$$

Use formula $(a+b)(a-b)=a^2-b^2$ to multiply:

$$(x+5)(x-5) = x^2-5^2 = x^2-25$$

(long way is: $x^2-5x+5x-25 = x^2-25$)

$$(8a-3b)(8a+3b) = (8a)^2-(3b)^2 = 64a^2-9b^2$$

Long way is

$$64a^2+24ab-24ab-9b^2 = \uparrow$$

Use the formula for a binomial squared to multiply: $(a-b)^2 = a^2 - 2ab + b^2$

$$(8x-3)^2 = (8x)^2 - 2(8x)(3) + 3^2$$
$$= 64x^2 - 48x + 9$$

Divide:

$$10y^4 - 35y^3 + 5y^2 \div 5y^2 = \frac{10y^4}{5y^2} - \frac{35y^3}{5y^2} + \frac{5y^2}{5y^2}$$

Remove the largest possible common factor:

$$9a^2b^2 - 36ab$$

$$9a^2b^2 - 36ab \Rightarrow \text{GCF} = 9ab$$

$$7x(3y+5z) - 6x(3y+5z)$$

$$\text{greatest in common (GCF)} = x \cdot (3y+5z)$$

Factor by grouping

$$3y^2 - y + 9y - 3 = y(3y-1) + 3(3y-1) = \boxed{(y+3)(3y-1)}$$

Factor:

$$x^2 + x - 42$$

$$x^2 + x - 42 = (x+7)(x-6)$$

$$x^2 + 4x - 12$$

$$x^2 + 4x - 12 = (x+6)(x-2)$$

Factor by using the difference of 2 squares:

$$a^2 - b^2 = (a-b)(a+b)$$

$$x^2 - 36 = (x-6)(x+6)$$

$$25x^2 - 81y^2 = (5x-9y)(5x+9y)$$
$$(5x)^2 - (9y)^2$$

Factor by using the perfect square trinomial formula:

$$x^2 + 8x + 16 \leftarrow \text{Assuming this is a (+) sign}$$

$$x^2 + 8x + 16 \rightarrow (x+4)(x+4) = \boxed{(x+4)^2}$$

$$\text{Perfect Square trinomial: } a^2 + 2ab + b^2 = (a+b)^2$$