

Direction: Write neatly; show your work in an organized fashion.

1. Simplify: $\left(\frac{3t^4}{2s^3}\right)^2$	2. Simplify: $(3x^5 - 4x^4 + 2x^2 + 3) - (2x^5 - 4x^4 + 3x^3 + 4x^2 - 5)$
3. Simplify: $(2x + 3y)(x - 5y)$	4. Simplify: $(x - 9)^2$
5. Simplify: $(4x^2 - 5x + 1)(3x - 2)$	6. Divide: $(6x^3 - 5x^2 - 13x + 13) \div (2x + 3)$
7. Simplify: $(2x^{-3}y)^{-2}$	8. Simplify: $\left(\frac{a^{-5}b}{a^8b^8}\right)$

<p>1. Simplify: $\left(\frac{3t^4}{2s^3}\right)^2$</p> $= \frac{3^2(t^4)^2}{2^2(s^3)^2} = \frac{9t^8}{4s^6}$	<p>2. Simplify:</p> $(3x^5 - 4x^4 + 2x^2 + 3) - (2x^5 - 4x^4 + 3x^3 + 4x^2 - 5)$ $= 3x^5 - 4x^4 + 2x^2 + 3 - 2x^5 + 4x^4 - 3x^3 - 4x^2 + 5$ $= 3x^5 - 2x^5 - 4x^4 + 4x^4 - 3x^3 + 2x^2 - 4x^2 + 3 + 5$ $= x^5 - 3x^3 - 2x^2 + 8$
<p>3. Simplify: $(2x + 3y)(x - 5y)$</p> $= 2x^2 - 10xy + 3xy - 15y^2$ $= 2x^2 - 7xy - 15y^2$	<p>4. Simplify: $(x - 9)^2$</p> $= x^2 - 9x - 9x + 81$ $= x^2 - 18x + 81$
<p>5. Simplify: $(4x^2 - 5x + 1)(3x - 2)$</p> $\begin{array}{r} 4x^2 - 5x + 1 \\ \underline{ 3x - 2} \\ -8x^2 + 10x - 2 \\ \underline{12x^3 - 15x^2 + 3x} \\ 12x^3 - 23x^2 + 13x - 2 \end{array}$	<p>6. Divide: $(6x^3 - 5x^2 - 13x + 13) \div (2x + 3)$</p> $\begin{array}{r} 3x^2 - 7x + 4 + \left(\frac{1}{2x+3}\right) \text{ remainder} \\ 2x+3 \overline{) 6x^3 - 5x^2 - 13x + 13} \\ \underline{-6x^3 - 9x^2} \text{ (subtraction: switches signs)} \\ -14x^2 - 13x \\ \underline{+14x^2 + 21x} \text{ (subtraction: switches signs)} \\ 8x + 13 \\ \underline{-8x - 12} \text{ (subtract: switches signs)} \\ 1 \text{ (Remainder of 1)} \end{array}$
<p>7. Simplify: $(2x^3y)^{-2}$</p> $= \left(\frac{2y}{x^3}\right)^{-2} = \left(\frac{x^3}{2y}\right)^2 = \frac{(x^3)^2}{(2y)^2}$ $= \frac{(x^3)^2}{2^2 y^2} = \frac{x^6}{4y^2}$ <p>This shows every step. It is OK if you did a few mentally.</p>	<p>8. Simplify: $\left(\frac{a^{-5}b}{a^8b^8}\right)$</p> <p>You can use the fraction cancellation way</p> $= \left(\frac{b}{a^5 a^8 b^8}\right) = \left(\frac{b}{a^{13} b^8}\right) = \frac{1}{a^{13} b^7}$ <p>or you can use the subtraction of exponents rule</p> $= a^{-5-8} b^{1-8} = a^{-13} b^{-7} = \frac{1}{a^{13} b^7}$