

1) Multiply: add exponents

$$2x^3 \cdot 8x^2 \cdot 4y^4 \cdot 3y^3$$

$$48x^5 y^7$$

5) Simplify.

$$(-x^3 z)^2 (x^4 y^2 z^3)$$

2) Simplify. Division: Subtract exponents high-low

$$\frac{z^6 y^3}{z^4 y^5 z^3} \cdot \frac{z^2}{y^2}$$

6) Rewrite the expression without using a negative exponent.

$$\frac{6z^{-2}}{z^2}$$

Create a fraction
Neg. exp. in numerator
Put in denominator

3) Simplify. Power to a power: distribute multiply exponents

$$\frac{-2^4 v^{12} w^4}{16 v^{12} w^4}$$

7) Rewrite the expression without using a negative exponent.

$$\frac{1}{4p^{-4}}$$

Neg. exp. in denominator
Put in numerator

4) Simplify.

$$\left(\frac{y^2}{-5x^4}\right)^3$$

$$\frac{y^6}{-125x^{12}}$$

8) Simplify.

$$\frac{p^{-7}}{p^{-8}} = p^{-7-(-8)} = p^1 = p$$

Anything to the Power of 1 is itself

11) Simplify.

$$\frac{6x^9 y^{-4} z^6 \cdot (-3)}{18x^{-2} z^{-3}}$$

$$\frac{1x^7 z^9}{3y^4}$$

15) Long Divide.

$$(x^2 + 9x + 16) \div (x + 5)$$

Binomial use long or synthetic

$$\begin{array}{r} x + 4 \\ x + 5 \overline{) x^2 + 9x + 16} \\ \underline{-x^2 - 5x} \\ 4x + 16 \end{array}$$

1) $x \cdot x = x^2$ $x \cdot 4 = 4x$
2) multiply by outside
3) flip signs

13)

Simplify.

Subtract: distribute

$$(5y^2 - 7y - 2) - (4y^2 - 3y + 1)$$

$$5y^2 - 7y - 2 - 4y^2 + 3y - 1$$

Combine like terms

$$1y^2 - 4y - 3$$

12)

Simplify.

adding: drop Parenthesis

$$(3u^2 - 2u + 7) + (-u^2 + 6u + 4)$$

$$3u^2 - 2u + 7 - u^2 + 6u + 4$$

Combine like terms

$$2u^2 + 4u + 11$$

16)

Divide.

$$(9x^3 + 24x^2 + 21x + 7) \div (3x + 2)$$

Binomial

$$\begin{array}{r} 3x^2 + 8x + 7\frac{1}{3} \\ 3x + 2 \overline{) 9x^3 + 24x^2 + 21x + 7} \\ \underline{9x^3 + 6x^2} \\ 18x^2 + 21x \\ \underline{18x^2 + 12x} \\ 9x + 7 \\ \underline{9x + 6} \\ x + 1 \\ \underline{x + 2} \\ -1 \\ \underline{-1} \\ 0 \end{array}$$

Synthetic

$$\begin{array}{r|rrrr} 2/3 & 3 & 8 & 7 & 1/3 \\ & \downarrow & -2 & -4 & 6/3 \\ \hline & 3 & 6 & 3 & 1 \end{array}$$

Bottom $3x^2 + 6x + 3 + \frac{1}{3}$

*only change exponents when mult/divide

14)

Multiply = Distribute each term

$$(2u - 3)(7u^2 - 6u + 4)$$

$$2u(7u^2 - 6u + 4) - 3(7u^2 - 6u + 4)$$

$$14u^3 - 12u^2 + 8u - 21u^2 + 18u - 12$$

Combine like terms +/-

$$14u^3 - 33u^2 - 10u - 12$$

17)

Use synthetic division to find the quotient and remainder when $-2x^3 + 6x^2 - 10x + 7$ is divided by $x - 2$. Specifically, complete the synthetic division table below, and write your answer in the following form:

Remainder

17)

$$\boxed{3x^2 + 6x + 3 + \frac{1}{3x+2}}$$

Use synthetic division to find the quotient and remainder when $-2x^3 + 6x^2 - 10x + 7$ is divided by $x-2$. Specifically, complete the synthetic division table below, and write your answer in the following form:

Quotient + $\frac{\text{Remainder}}{x-2}$.

$$2 \overline{) -2 \quad 6 \quad -10 \quad 7}$$

$$140^3 - 330^2 - 100 - 12$$

18)

Use synthetic division to find the quotient and remainder when $-x^4 - 2x^3 + 10x^2 + 8x + 3$ is divided by $x+4$. Specifically, complete the synthetic division table below, and write your answer in the following form:

Quotient + $\frac{\text{Remainder}}{x+4}$.

$$-4 \overline{) -1 \quad -2 \quad 10 \quad 8 \quad 3}$$

19) Divide. ^{two terms}

$$\frac{18x^4 - 10x^3}{2x^2}$$

Monomial
Create
fractions

$$\frac{18x^{4-2}}{2x^2} - \frac{10x^{3-2}}{2x^2}$$

$$\boxed{9x^2 - 5x}$$

20)

Divide. ^{two} mono:
numerator denom
 $(11x^7y^5 \ominus 6x^7y) \div (-2x^5y^3)$

$$\frac{11x^7y^{5-3}}{-2x^2y^2} - \frac{6x^7y^{-5}}{-2x^2y^{3-1}}$$

$$\frac{11x^2y^2}{-2} + \frac{3x^2}{y^2}$$