

Homework 1.

Name:

ID:

(1) The additive inverse of $(-\frac{2}{5})$ is $\frac{2}{5}$.

(2) The multiplicative inverse of $(-\frac{2}{5})$ is $-\frac{5}{2}$.

(3) Simplify the following expressions

$$(A) \frac{3}{2} \left(4 - \frac{3}{5} \right) = \frac{3}{2} \left(\frac{4(5) - (1) \cdot (3)}{1 \cdot 5} \right) = \frac{3}{2} \left(\frac{20 - 3}{5} \right) = \frac{3}{2} \left(\frac{17}{5} \right) = \frac{51}{10}$$

$$(B) \left(\frac{2}{3} + \frac{5}{2} \right) \cdot \frac{3}{4} \left(\frac{2 \cdot 2 + 5 \cdot 5}{3 \cdot 2} \right) \cdot \frac{3}{4} = \left(\frac{4 + 15}{6} \right) \cdot \frac{3}{4} = \frac{19}{2} \cdot \frac{1}{4} = \frac{19}{8}$$

$$(C) \frac{1}{10} \left(\frac{3}{2} + \frac{2}{7} \right)^{-1} = \frac{1}{10} \left(\frac{21 + 4}{14} \right)^{-1} = \frac{1}{10} \left(\frac{25}{14} \right)^{-1} = \frac{1}{5} \left(\frac{7}{25} \right) = \frac{7}{125}$$

$$(D) (3a^3)(2a^5)(5x^{-4})$$

$$6a^8 \cdot 5x^{-4} = \frac{30a^8}{x^4}$$

$$(E) \frac{24x^4y^{-3}}{8x^{-3}y^{-2}}$$

$$\frac{3x^7}{y}$$

$$(F) \left(\frac{m^{-3} \cdot n^{-3}}{n^2} \right)^{-4}$$

$$\frac{m^{12} \cdot n^{12}}{n^8} = m^{12} \cdot n^4$$

$$(G) 2\sqrt{18} + 4\sqrt{2} = 2\sqrt{9} \cdot \sqrt{2} + 4\sqrt{2}$$

$$2 \cdot 3\sqrt{2} + 4\sqrt{2} = 6\sqrt{2} + 4\sqrt{2} = \boxed{10\sqrt{2}}$$

$$(H) 5\sqrt{27} - 4\sqrt{12}$$

$$5\sqrt{9} \cdot \sqrt{3} - 4 \cdot \sqrt{4} \cdot \sqrt{3}$$

$$= 5 \cdot 3\sqrt{3} - 4 \cdot 2\sqrt{3} = 15\sqrt{3} - 8\sqrt{3} = \boxed{7\sqrt{3}}$$

$$(I) \sqrt[5]{32(2u^2v^3)^0}$$

$$\sqrt[5]{32 \cdot 1} = \sqrt[5]{32} = 2$$

$$(J) \sqrt[n]{(2uv)^{2n}}$$

$$\sqrt[n]{((2uv)^2)^n} = (2uv)^2 = 4u^2v^2$$

$$(K) \sqrt{64m^6n^3z^9}$$

$$= 8m^3n^{\frac{3}{2}}z^{\frac{9}{2}}$$

$$(L) \left(\frac{16x^4y^8}{z^4}\right)^{\frac{1}{4}}$$

$$4 \sqrt[4]{\frac{2^4 x^4 y^8}{z^4}} = \frac{2xy^2}{z}$$

$$(M) \left(-\frac{8x^3}{27y^6}\right)^{\frac{3}{2}}$$

is not real

$$(N) \sqrt[3]{\frac{64x^3}{27y^6}} = \frac{4x}{3y^2}$$

$$(O) 2\sqrt{x} \left(3\sqrt{x} - \frac{1}{\sqrt{x}}\right)$$

$$2 \cdot 3(\sqrt{x})^2 - 2\sqrt{x} - \frac{1}{\sqrt{x}} = 6x - 2$$

(3) Given a polynomial $5x^3y - 2x^2y^3 - 6x^2 - 5$, then its degree is.....⁵

(4) Add: $3x^4 - 2x^3 + x^2$ and $x^3 - 3x^2 + x - 5$

$$3x^4 - x^3 - 2x^2 + x - 5$$

(5) Subtract: $2x^2 + 3x - 2$ from $3x^2 + 3x - 3$

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

(6) Multiply: $(x^2 + 2x)(3x + 5)$

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

$$3x^3 + 5x^2 + 6x^2 + 10x = 3x^3 + 11x^2 + 10x$$

(7) Factor $3xy - xz + 6wy - 2wz$

$$(3xy - xz) + (6wy - 2wz)$$

$$x(3y - z) + 2w(3y - z) = (x + 2w)(3y - z)$$

(8) Factor $3x^2 + 4y - 15$

is not factoring

(9) Factor $16x^2 - 25y^2$

$$(4x - 5y)(4x + 5y)$$

(10) Factor $64u^3 - 27$

$$(4u - 3)(16u^2 + 12u + 9)$$