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Period: 3

2.1-2.4 Project

Exponent Properties: zero property of exponent $1) 5^0 = 1$ $2) \left(\frac{x^2y}{4}\right)^0 = 1$

Property of negative Exponent: $1) x^{-3} = \frac{1}{x^3}$

Product of powers property: $1) x^3 \cdot x^2 = x^5$ $2) 3y^5 \cdot 2y^3 = 6y^8$

Quotient of powers property: $1) (xy)^5 = x^5y^5$ $2) (3x^2y)^2 = 9x^4y^2$

Power of product property: $1) \frac{x^7}{x^2} = x^5$ $2) \frac{4xy^3}{2xy^2} = 2y$

Power of quotient property: $1) \left(\frac{x}{y}\right)^6 = \frac{x^6}{y^6}$ $2) \left(\frac{x^5}{3x}\right)^2 = \frac{x^{10}}{9x^2} = \frac{x^8}{9}$

Power of power property: $1) (x^2)^3 = x^6$ $2) (3xy^3)^4 = 3^4x^4y^{12} = 81x^4y^{12}$

Four simplifying exponent properties:

1. Product of powers property:
 $Z^6 \cdot Z^4 = Z^{10}$

2. Power of product
 $\frac{Z^{13}}{Z^4} = Z^9$

3. Power of power property
 $(Z^5)^5 = Z^{25}$

4. Zero property of exponent
 $(5^3)^0 = 1$

four simplifying radical expressions:

1) $2\sqrt[3]{10} - 3\sqrt{5} - 6\sqrt[3]{10} + 7\sqrt{5}$
 $(2\sqrt[3]{10} - 6\sqrt[3]{10}) + (3\sqrt{5} + 7\sqrt{5})$
 $2-6 = -4$ $3+7 = 10$
 $-4\sqrt[3]{10} + 10\sqrt{5}$

2) $8\sqrt[3]{2} - 7\sqrt{4} - 6\sqrt[3]{2} + 5\sqrt{4}$
 $(8\sqrt[3]{2} - 6\sqrt[3]{2}) + (7\sqrt{4} + 5\sqrt{4})$
 $8-6 = 2$ $7+5 = 12$
 $2\sqrt[3]{2} + 12\sqrt{4}$

3) $2\sqrt[3]{20} - 5\sqrt{5} - 7\sqrt[3]{20} - 2\sqrt{5}$
 $(2\sqrt[3]{20} - 7\sqrt[3]{20}) + (5\sqrt{5} + 2\sqrt{5})$
 $2-7 = -5$ $5+2 = 7$
 $-5\sqrt[3]{20} + 7\sqrt{5}$

4) rationalize the denominator

$\frac{5}{\sqrt{2}}$
 $\frac{5}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$
 $\frac{5\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{5\sqrt{2}}{\sqrt{4}} = \frac{5\sqrt{2}}{2}$
 $\frac{5\sqrt{2}}{2}$

Extraneous Solution: $x = \sqrt{8x+36} + 6$

$(x-6) = \sqrt{8x+36}$
 $(x-6)^2 = 8x+36$
 $x^2 - 12x + 36 = 8x + 36$
 $x^2 - 20x = 0$

$x(x-20) = 0$
 $x = 0$ $x = 20$