Bellwork Hon Alg 2 Wednesday, April 12, 2017

Simplify each. Assume all variables are positive. Make sure all denominators are rationalized.

1. $\frac{2x^3 - 72x}{x^2 + 4x - 12} \div \frac{6x^5 - 24x^4 - 72x^3}{x^5 - 2x^3 - 8x} =$

2. $\frac{\frac{5}{x-3}}{\frac{2}{x^2 + x - 12} - \frac{9}{x+4}} =$

3. $\sqrt[3]{10m^4n} \cdot \sqrt[3]{14m^2n^5p^7} \cdot \sqrt[3]{18n^7p^8} =$

4. $\frac{\sqrt{27G^5K^4}}{\sqrt{24G^2K^9}} =$

5. Rationalize the denominator. $\frac{10a^2b}{\sqrt[4]{125a^5b^{14}}} =$

6. Solve. $\sqrt{33 - 4x} + 3 = x$

Honors Alg 2 Bellwork 4-12-17 Answers

① $\dfrac{2x^3-72x}{x^2+4x-12} \div \dfrac{6x^5-24x^4-72x^3}{x^5-2x^3-8x} \Rightarrow \dfrac{2x(x^2-36)}{x^2+4x-12} \cdot \dfrac{x(x^4-2x^2-8)}{6x^3(x^2-4x-12)}$

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

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

$x(x^4-2x^2-8) = x(x^2-4)(x^2+2)$

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

$6x^3(x^2-4x-12) = 6x^3(x-6)(x+2)$

$= \dfrac{2x(x+6)(x-6)}{(x+6)(x-2)} \cdot \dfrac{x(x+2)(x-2)(x^2+2)}{6x^3(x-6)(x+2)}$

$= \dfrac{2x^2(x^2+2)}{6x^3} = \boxed{\dfrac{x^2+2}{3x}}$

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② $\dfrac{\frac{5}{x-3}}{\frac{2}{x^2+x-12}-\frac{9}{x+4}} = \dfrac{\frac{5}{x-3}}{\frac{2}{(x-3)(x+4)}-\frac{9}{x+4}} \cdot \dfrac{(x-3)(x+4)}{(x-3)(x+4)} = \dfrac{5(x+4)}{2-9(x-3)}$

$= \dfrac{5x+20}{2-9x+27}$

$= \boxed{\dfrac{5x+20}{-9x+29}}$

(3) $\sqrt[3]{10m^4n} \cdot \sqrt[3]{14m^2n^5p^7} \cdot \sqrt[3]{18n^7p^8}$

$= \sqrt[3]{2 \cdot 5 m^4 n} \cdot \sqrt[3]{2 \cdot 7 m^2 n^5 p^7} \cdot \sqrt[3]{2 \cdot 9 n^7 p^8}$

$= \sqrt[3]{2^3 \cdot 5 \cdot 7 \cdot 9 \, m^6 n^{13} p^{15}}$

$= \boxed{2m^2n^4p^5 \sqrt[3]{315n}}$

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(4) $\dfrac{\sqrt{27G^5K^4}}{\sqrt{24G^2K^9}} = \dfrac{\sqrt{9G^3}}{\sqrt{8K^5}} = \dfrac{3G\sqrt{G}}{2K^2\sqrt{2K}} \cdot \dfrac{\sqrt{2K}}{\sqrt{2K}}$

$= \dfrac{3G\sqrt{2GK}}{2K^2\sqrt{4K^2}}$

$= \dfrac{3G\sqrt{2GK}}{2K^2 \cdot 2K}$

$= \boxed{\dfrac{3G\sqrt{2GK}}{4K^3}}$

(5)

$$\frac{10a^2b}{\sqrt[4]{125a^5b^{14}}} = \frac{10a^2b}{\sqrt[4]{5^3a^5b^{14}}} \cdot \frac{\sqrt[4]{5a^3b^2}}{\sqrt[4]{5a^3b^2}}$$

$$= \frac{10a^2b\sqrt[4]{5a^3b^2}}{\sqrt[4]{5^4a^8b^{16}}}$$

$$= \frac{10a^2b\sqrt[4]{5a^3b^2}}{5a^2b^4} = \boxed{\frac{2\sqrt[4]{5a^3b^2}}{b^3}}$$

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(6)

$$\sqrt{33-4x} + 3 = x$$
$$-3 \quad -3$$

$$\left(\sqrt{33-4x}\right)^2 = (x-3)^2$$

$$33 - 4x = x^2 - 6x + 9$$
$$-33 \quad +4x \qquad +4x \quad -33$$

$$0 = x^2 - 2x - 24$$

$$0 = (x-6)(x+4)$$

$x = 6, -4$ (-4 extraneous solution)

$$\boxed{x = 6}$$