

Name: Key Date: _____ Period: _____

Miami Central Senior High Topic I Review

1. A rectangle has side of 3 inches and $\sqrt{5}$ inches. Find the area of the rectangle? Is the area rational or irrational?

$$\text{Area} = \text{base} \cdot \text{height}$$

$$3 \cdot \sqrt{5} = \text{Irrational}$$

2. True or false

- a) Any irrational number added to any rational number is always equal to a rational number. $\sqrt{5} + 0 = \sqrt{5}$ False

- b) Any irrational number added to any irrational number is always equal to a rational number.

False

- c) Any irrational number multiplied by any non-zero rational number is always equal to a rational number.

False

- d) Any irrational number multiplied by any non-zero rational is always equal to an irrational number.

True

3. If $X > 0$ for what value of n does $(\sqrt[n]{X})^n = X$?

$$\left(X^{\frac{1}{n}}\right)^n = X \quad \text{So } n = 5$$

4. Simplify:

a) $(\sqrt{5})(\sqrt[3]{5}) = 5^{\frac{1}{2}} \cdot 5^{\frac{1}{3}} = 5^{\frac{1}{2} + \frac{1}{3}} = 5^{\frac{5}{6}}$

$$\frac{3}{3} \cdot \frac{1}{2} + \frac{1}{3} \cdot \frac{2}{2} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

b) $\sqrt{X^{32}} \rightarrow \sqrt[2]{X^{32}} = X^{\frac{32}{2}}$

c) $\frac{18a^6b^4c^2}{3abc} = \frac{6a^5b^3c}{1} = 6a^5b^3c$

d) $(8xy^9)(4x^4y) = 32x^5y^{10}$

$$e) (35a^{12}) \div (7a^3) = \frac{35a^{12}}{7a^3} = 5a^9$$

$$f) x^{-6} * \frac{x^{-2}}{x^4} = \frac{x^{-6} x^{-2}}{x^4} = \frac{1}{x^{+6} x^{+2} x^4} = \frac{1}{x^{12}} = x^{-12}$$

$$g) (3m) \times (2m) \times (4m) \times (2m) \\ 3 \cdot 2 \cdot 4 \cdot 2 \text{ m m m m} = 48 \text{ m}^4$$

$$h) (-3x^7)(-6x^5) = 18x^{12}$$

5. How many terms are in the expression $\underbrace{5a^5bc} + \underbrace{a^6b} + \underbrace{3ab^3} - \underbrace{6a^4} + \underbrace{5b}$

6

6. If $x^{\frac{1}{2}} = 10$, what is the value of x? $\sqrt{x} = 10$

100

7. Change each radical expression to exponential form

a) $(\sqrt[5]{n})^8 = (n^{\frac{1}{5}})^8 = n^{\frac{8}{5}}$

b) $(\sqrt[3]{n}) = n^{\frac{1}{3}}$

c) $(\sqrt{n})^6 = (n^{\frac{1}{2}})^6 = n^{\frac{6}{2}} = n^{\frac{3}{1}} = n^3$

8. What is the sum of the coefficients of the expression $5a^5bc + a^6b + 3ab^3 - 6a^4 + 5b$

$5 + 1 + 3 - 6 + 5 = 8$

9. Simplify:

a) $\sqrt{\frac{81}{16}} = \frac{\sqrt{81}}{\sqrt{16}} = \frac{9}{4}$

$$b) \sqrt{\frac{49}{100}} = \frac{\sqrt{49}}{\sqrt{100}} = \frac{7}{10}$$

$$c) \frac{\sqrt{64x^8}}{8x^3} = \frac{8x^4}{8x^3} = x$$

$$d) (3x^3)^2 = 3^2 x^6 = 9x^6$$

$$e) (-2x^2)^3 = (-2)(-2)(-2) x^6 = -8x^6$$

$$f) 2x^{-\frac{3}{4}} = \frac{2}{x^{\frac{3}{4}}} = \frac{2}{\sqrt[4]{x^3}}$$

10. If the side length of a square, l , may be found using the formula $l = A^{\frac{1}{2}}$, where A is the area of the square. What is the length of one side of a square that has an area of 225 square kilometers?

$$A = 225 \quad 225^{\frac{1}{2}} = l \quad \sqrt{225} = 15$$

11. Simplify:

$$a) -4x^5(-9x^3 - 5x^2 + 10x)$$

$$36x^8 + 20x^7 - 40x^6$$

$$b) (7x^2 - x + 4) - (-5x^2 - 4x + 1)$$

$$7x^2 - x + 4 + 5x^2 + 4x - 1$$

$$12x^2 + 3x + 3$$

$$c) (-3x^2 - 9x + 1) + (5x^2 + 2x - 6)$$

$$2x^2 - 7x - 5$$

$$\begin{array}{l} \text{d) } 20x - 4(4x + 2) \\ \quad 20x - 16x - 8 \\ \quad \quad 4x - 8 \end{array}$$

12. Complete the sentence and give one example:

- a) The product of a rational and a rational is Rational
- b) The sum of a rational and a rational is Rational
- c) The quotient of an integer and an integer is Rational

Good Luck !!