

Unit Test 2 – No Calculators Allowed (Practice Version)

Show all your work. Indicate clearly the methods you use, because you will be graded on correctness of your methods as well as on the accuracy and completeness of your results and explanations.

1. Evaluate the following expressions for $x = -2$: [3pts each]

a. $3x - 5$ _____

b. $2x^2 + 4x - 7$ _____

c. $5 - x^2$ _____

2. The length of a rectangle is 3 times its width. If the area of the rectangle is 75 square meters, write an equation and solve for the dimensions of the rectangle. [3pts]

3. The sum of three consecutive integers is 72. Write an equation and solve for the three integers. [3pts]

4. Simplify the following expressions by combining like terms. [3pts each]

a. $3x^2 + 2x - 7 - x^2 + 5x$ _____

b. $2xy^2 + 3x^2y - 5xy + x^2y - 4x^2y$ _____

c. $3a^2b + 2ab^2 - 5a^2b - ab^2$ _____

d. $5x^3y^2 - 2xy^2 + 3x^3y^2 + 2xy^2$ _____

5. Simplify the following rational expressions: [3pts each]

a. $\frac{4x^3y^2}{2x^2y} =$

b. $\frac{2a^4b^2}{4ab^3} =$

6. Simplify the following expressions by using the laws of exponents.

a. $(4x^2y^3)^3 =$

b. $(x^4y^2)^2 =$

7. Rewrite the following expressions with positive exponents.

a. x^{-3}

b. $(xy)^{-2}$

8. Simplify the following by adding or subtracting.

a. $\frac{5}{x+2} - \frac{1}{x-3}$

b. $\frac{3}{x-4} + \frac{5}{2x+1}$

9. Convert the interval $[2,6]$ to set builder notation. _____

10. Convert the set builder notation $\{x|0 < x \leq 3\}$ to interval notation. _____

11. Write the set of even integers between -4 and 4 in set builder notation. _____

12. Determine whether the set $A = \{1,2,3\}$ is a subset of the set $B = \{0,1,2,3,4\}$. (Yes/No, explain why.)

13. Let $U = \{1,2,3,4,5,6,7,8,9,10\}$ be a universal set. If $A = \{1,3,5,7,9\}$, find the complement of A .

14. Let $U = \{a, b, c, d, e, f, g, h, i, j\}$ be the universal set. If $A = \{a, b, c, d, e\}$ and $B = \{c, d, e, f, g\}$ find $A \cup B$ and $A \cap B$ using a Venn diagram.

15. In a class of 30 students, 18 play basketball, 15 play football, and 10 play both sports. How many students play neither basketball nor football?

16. State the names for the following algebraic properties of equality.

a. $(x + 5) + 2 = x + (5 + 2)$ _____

b. $x + 5 = 5 + x$ _____

c. $(2 \cdot x) \cdot 5 = 2(x \cdot 5)$ _____

d. $x \cdot 6 = 6 \cdot x$ _____

e. $2(x + 4) = 2 \cdot x + 2 \cdot 4$ _____

17. Solve the equation for x :

a. $2x + 5 = 17$

b. $3x - 4 = 5(x + 2)$