Name: _____   Date: _____
Math 412- Ms. Castellano   Mixed Review

Answer each question. Show all work to receive full credit.

1. Solve the equation for all values of x.

$$2 + 2|3x + 4| = 14$$

2. Express $(x + y)^2$ as a trinomial in simplest form.

3. Solve for y: $x + \sqrt{2y} = 6$

4. Julie has three children whose ages are consecutive odd integers. If x represents the youngest child's age, which expression represents the sum of her children's ages?
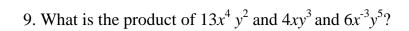
$\qquad$ (1) $3x + 3$ $\qquad\qquad\qquad$ (3) $3x + 4$

$\qquad$ (2) $3x + 5$ $\qquad\qquad\qquad$ (4) $3x + 6$

5. How many solutions does each equation have:

    (a) $-2|3x - 2| = 10$ _____

    (b) $2 + |x - 4| = 2$ _____

    (c) $|5 - x| + 7 = 10$ _____

6. Find the sum of $4x^2 - 3x + 6$, $-7x^2 + 3x + 6$, and $2x(9 + 7x - x^2)$.

7. Solve and graph the solution: $2|2x + 3| + 5 \leq 15$

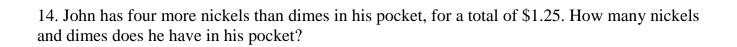8. Identify the **largest integer** in the solution set of $\frac{3x}{2} - 6 < 9$.

9. What is the product of $13x^4 y^2$ and $4xy^3$ and $6x^{-3}y^5$?

10. Solve and graph the solution of $-6x - 17 \geq 8x + 25$.

11. Simplify: $\dfrac{8x^5 - 2x^4 + 4x^3 - 6x^2}{2x^2}$

12. It takes a snail 500 hours to travel 15 miles. At this rate, how many minutes will it takes the snail to travel 6 miles?

13. What is the value of the expression $3a^2 - 4|a| + 6$ when $a = -3$?

14. John has four more nickels than dimes in his pocket, for a total of $1.25. How many nickels and dimes does he have in his pocket?

15. What is the solution of $\frac{k+4}{2} = \frac{k+9}{3}$?

16. Sometimes business partners do not share the ownership of a business equally. Instead, they each own a percent of the business, and each receives that percent of the profits. Alvarez, Brown, and Chow are partners in a business that earned $500,000. Alvarez owns 40% of the business and Chow received $175,000. [6]

    a. How much money did Alvarez and Brown each receive?

    b. What percent of the business is owned by Brown? by Chow?

17. Molly is one third the age of her mom. In 12 years, Molly will be half the age of her mom then. How old is Molly and her mom now?

18. Chad had a garden that was in the shape of a rectangle. Its length was twice its width. He decided to make a new garden that was 2 feet longer and 2 feet wider than his first garden. If x represents the original width of the garden, write an expression to represent the difference between the area of his new garden and the area of the original garden.

19. Give an example of each of the following properties:

a. Distributive Property of Multiplication over Addition _____

b. Associative Property of Addition _____

c. Commutative Property of Multiplication _____

d. Additive Identity _____

e. Additive Inverse _____

f. Multiplicative Identity _____

g. Multiplicative Inverse _____

20. Solve and graph: $2x - 4 \leq 8$ and $x + 5 \geq 7$?

21. What is the value of x in the equation $\dfrac{x-2}{3} + \dfrac{1}{6} = \dfrac{5}{6}$?

22. Claire has $200 in her bank account and she saves $50 per month more. Ethan has $500 in his bank account, but he withdraws $25 per month to pay for his cell phone.

Write an equation to represent the amount of money in each account.

How many months will pass before they have the same amount?

23. Joe is buying a motorcycle in a state that charges 9% sales tax. There is also a $500 title and license fee that he is required to pay upon purchasing the motorcycle. If Joe can spend at least $15,500 but no more than $20,000, what is the price range for the motorcycle he can buy?