Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Apply the quotient rule for exponents, if applicable, and write the result using only positive exponents. Assume all variables represent nonzero numbers.

1) $\dfrac{x^{-12}}{x^{-12}}$

        1) _____

    A) x^{24} B) $-x^{12}$ C) $\dfrac{1}{x^{24}}$ D) 1

Find the product.

2) $(x - 5)(3x - 10)$

        2) _____

    A) $3x^2 + 50x - 25$ B) $3x^2 - 26x + 50$ C) $3x^2 - 25x + 50$ D) $x^2 - 25x - 25$

Divide.

3) $\dfrac{x^2 + 8x + 8}{x + 6}$

        3) _____

    A) $x + 3$ B) $x + 2 - \dfrac{4}{x + 6}$ C) $x + 2 + \dfrac{4}{x + 6}$ D) $\dfrac{x + 2}{x + 6}$

Add or subtract as indicated.

4) Subtract.

$\begin{array}{r} 3q^2 + 10q - 8 \\ 6q^2 + 8q + 5 \\ \hline \end{array}$

        4) _____

    A) $-9q^2 - 18q + 3$ B) $3q^2 - 2q + 13$ C) $9q^2 + 18q - 3$ D) $-3q^2 + 2q - 13$

Factor by grouping.

5) $x^3 + 3x^2 - 2x - 6$

        5) _____

    A) $(x^2 + 3)(x - 2)$ B) $(x - 3)(x^2 - 2)$ C) $(x + 3)(x^3 - 2x)$ D) $(x + 3)(x^2 - 2)$

Factor the trinomial completely.

6) $15z^2 + 2z - 8$

        6) _____

    A) $(3z - 2)(5z + 4)$ B) $(3z + 2)(5z - 4)$ C) $(15z - 2)(z - 8)$ D) $(15z - 2)(z + 4)$

Factor the polynomial completely.

7) $x^3 - 64$

        7) _____

    A) $(x + 64)(x^2 - 1)$ B) $(x + 4)(x^2 - 4x + 16)$

    C) $(x - 4)(x^2 + 4x + 16)$ D) $(x - 4)(x^2 + 16)$

Find all solutions by factoring.

8) $(x - 10)(x + 10) = -19$

    A) $\{-10, -9\}$ B) $\{9, -9\}$ C) $\{10, -10\}$ D) $\{-29, 10\}$

8) _____

Solve the problem.

9) A room has an area of 322 square feet. One dimension is 9 feet more than the other. Find the dimensions of the room.

    A) 23 feet, 32 feet   B) 14 feet, 23 feet   C) 5 feet, 14 feet   D) 17 feet, 26 feet

9) _____

Find all numbers not in the domain of the function.

10) $f(x) = \dfrac{9}{x + 5}$

    A) -5 B) 0 C) None   D) 5

10) _____

Add or subtract as indicated. Write the answer in lowest terms.

11) $\dfrac{2}{y^2 - 3y + 2} + \dfrac{7}{y^2 - 1}$

    A) $\dfrac{9y - 12}{(y - 1)(y - 2)}$ B) $\dfrac{12y - 9}{(y - 1)(y + 1)(y - 2)}$

    C) $\dfrac{28y - 12}{(y - 1)(y + 1)(y - 2)}$ D) $\dfrac{9y - 12}{(y - 1)(y + 1)(y - 2)}$

11) _____

Perform the indicated operation and express in lowest terms.

12) $\dfrac{z^2 + 13z + 36}{z^2 + 17z + 72} \div \dfrac{z^2 + 4z}{z^2 + 6z - 16}$

    A) $\dfrac{z - 2}{z^2 + 8z}$ B) $\dfrac{z}{z^2 + 17z + 72}$ C) $z - 2$ D) $\dfrac{z - 2}{z}$

12) _____

Simplify the complex fraction.

13) $\dfrac{\dfrac{1}{a} + 1}{\dfrac{1}{a} - 1}$

    A) $\dfrac{1 + a}{1 - a}$ B) $\dfrac{a}{1 - a^2}$ C) 1 D) $1 - a^2$

13) _____

Without actually solving the equation, list all possible numbers that would have to be rejected if they appeared as potential solutions.

14) $\dfrac{20}{x + 12} - \dfrac{5}{x + 10} = 0$

    A) $-12, -10, 20, 5$ B) $-12, -10$ C) $12, 10, -20, -5$ D) $12, 10$

14) _____

Solve the equation.

15) $\dfrac{2}{x-2} + \dfrac{10}{x} = \dfrac{-20}{x^2 - 2x}$

    A) $\{-2\}$ B) $\{0\}$ C) $\varnothing$ D) $\{0, 2\}$

15) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the formula for the specified variable.

16) $\dfrac{PV}{T} = \dfrac{pv}{t}$ for P

16) _____

Solve the problem. Round your answer, as needed.

17) Dr. Wong can see 12 patients in 2 hours. At this rate, how long would it take her to see 60 patients?

17) _____

Solve the problem.

18) A plane flies 430 miles with the wind and 340 miles against the wind in the same length of time. If the speed of the wind is 27 mph, what is the speed of the plane in still air?

18) _____

19) One maid can clean the house three times faster than another. Working together they can clean the entire house in 3 hours. How long would it take the faster maid cleaning alone?

19) _____

Simplify the expression so that no negative exponents appear in the final result. Assume all variables represent nonzero numbers.

20) $(x^{-4}y^5)^{-2}$

20) _____

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Name_____

1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

7) _____

8) _____

9) _____

10) _____

11) _____

12) _____

13) _____

14) _____

15) _____

16) _____

17) _____

18) _____

19) _____

20) _____