Math 90
Test #2
Chapters 5, 6 and 7

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) \( \frac{x^{-17}}{x^{-8}} \)

A) \( \frac{1}{x^{25}} \)  
B) \( \frac{1}{x^9} \)  
C) \( x^9 \)  
D) \( -x^{25} \)

Find the product.

2) \( (2x + 3)(x - 9) \)

A) \( x^2 - 15x - 24 \)  
B) \( 2x^2 - 24x - 27 \)  
C) \( x^2 - 27x - 15 \)  
D) \( 2x^2 - 15x - 27 \)

Divide.

3) \( \frac{x^2 + 4x - 32}{x + 8} \)

A) \( x^2 - 4 \)  
B) \( x + 4 \)  
C) \( x^2 + 5x - 24 \)  
D) \( x - 4 \)

Add or subtract as indicated.

4) \( (5n^5 - 5n - 9n^3) + (-9n^3 + 3n^5 - 7n) \)

A) \( -2n^5 - 4n^3 - 16n \)  
B) \( -22n^9 \)  
C) \( 8n - 18n^5 - 12n^3 \)  
D) \( 8n^5 - 18n^3 - 12n \)
Factor by grouping.

5) \( t^2 + 7t + 4t + 28 \)

A) \((t + 7)(t - 4)\)  
B) \(t(t + 28)\)  
C) \((t + 7)(t + 4)\)  
D) \((t - 7)(t - 4)\)

Factor the trinomial completely.

6) \(16y^2 + 24y + 9\)

A) \((16y + 1)(y - 9)\)  
B) \((16y + 3)(y + 3)\)  
C) \((4y + 3)(4y + 3)\)  
D) \((4y - 3)(4y - 3)\)

Factor the polynomial completely.

7) \(t^3 + 216\)

A) \((t + 6)(t^2 + 36)\)  
B) \((t + 6)(t^2 - 6t + 36)\)  
C) \((t - 216)(t^2 + 1)\)  
D) \((t - 6)(t^2 + 6t + 36)\)

Solve the equation.

8) \((7y + 26)(4y + 7) = 0\)

A) \(\left\{-\frac{7}{19}, -\frac{4}{7}\right\}\)  
B) \(\left\{\frac{26}{7}, \frac{7}{4}\right\}\)  
C) \(\left\{-\frac{26}{7}, -\frac{7}{4}\right\}\)  
D) \(\{19, 3\}\)
Solve the problem.

9) A triangular garden has an area of 189 square feet. Its height is 3 feet more than its base. Find the measure of the base.

9) _______

A) 18 feet               B) 36 feet               C) 15 feet               D) 21 feet

Find all numbers not in the domain of the function.

10) f(x) = \frac{x^2 - 64}{x^2 - 2x - 48}

10) _______

A) 6, -8               B) 8, -8               C) -6, 8               D) 0

Find the domain of the rational function.

11) f(x) = \frac{x - 1}{7x + 8}

11) _______

A) \{x \mid x \neq \frac{8}{7}\}               B) \{x \mid x \neq -\frac{8}{7}, 1\}               C) (-\infty, \infty)               D) \{x \mid x \neq \frac{8}{7}\}

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

12) \frac{x}{x^2 - 16} - \frac{4}{x^2 + 5x + 4}

12) _______

A) \frac{x^2 - 3}{(x - 4)(x + 4)(x + 1)}               B) \frac{x^2 - 3x + 16}{(x - 4)(x + 4)(x + 1)}

C) \frac{x^2 - 3x + 16}{(x - 4)(x + 4)}               D) \frac{x^2 + 3x + 16}{(x - 4)(x + 4)(x + 1)}
Perform the indicated operation and express in lowest terms.

13) \( \frac{z^2 + 9z + 18}{z^2 + 15z + 54} + \frac{z^2 + 3z}{z^2 + 13z + 36} \)

\[ \text{A) } \frac{z + 4}{z} \quad \text{B) } z + 4 \quad \text{C) } \frac{z}{z^2 + 15z + 54} \quad \text{D) } \frac{z + 4}{z^2 + 9z} \]

Simplify the complex fraction.

14) \( \frac{4 + \frac{2}{x}}{\frac{x}{3} + \frac{1}{6}} \)

\[ \text{A) } 1 \quad \text{B) } \frac{x}{12} \quad \text{C) } 12 \quad \text{D) } \frac{12}{x} \]
Without actually solving the equation, list all possible numbers that would have to be rejected if they appeared as potential solutions.

\[
\frac{14}{6x + 13} - \frac{1}{x} = \frac{1}{13x - 9}
\]

15) _______

A) \(-\frac{13}{6}, \frac{9}{13}\)  
B) \(0, -\frac{13}{6}, \frac{9}{13}\)  
C) \(-\frac{13}{6}, \frac{9}{13}, -14\)  
D) \(0, \frac{13}{6}, -\frac{9}{13}\)

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

Solve the equation.

\[
\frac{x}{2x + 2} = \frac{-2x}{4x + 4} + \frac{2x - 3}{x + 1}
\]

16) __________
Solve the problem.

17) A ball is projected upward from ground level. After t seconds, its height in feet is a function defined by \( f(t) = -16t^2 + 48t \). After how many seconds will it reach a height of 32 ft?

Perform the indicated operation and express in lowest terms.

18) \( \frac{2k^2 + 7kp + 6p^2}{9k^2 - 24kp + 16p^2} \div \frac{6k^2 + 17kp + 12p^2}{9k^2 - 16p^2} \)

Solve the problem.

19) If \( f \) varies jointly as \( q^2 \) and \( h \), and \( f = 54 \) when \( q = 3 \) and \( h = 3 \), find \( f \) when \( q = 4 \) and \( h = 6 \).
Solve the equation.

20) \[ \frac{2y + 3}{y} = \frac{3}{2} \]
1) B  
2) D  
3) D  
4) D  
5) C  
6) C  
7) B  
8) C  
9) A  
10) C  
11) D  
12) B  
13) A  
14) D  
15) B  
16) [3]  
17) 1 sec and 2 sec  
18) \frac{k + 2p}{3k - 4p}  
19) 192  
20) {-6}