Intermediate Algebra Final Review LRM

Name_____

Evaluate the expression.

1) $\left(\frac{4}{3}\right)^{-3}$ 1) _____

A) $\frac{64}{27}$ B) $-\frac{64}{27}$ C) $-\frac{27}{64}$ D) $\frac{27}{64}$

Simplify the expression and write the answer without negative exponents.

2) $\frac{5m^{-3}n^{-2}}{8p^{-4}}$ 2) _____

A) $\frac{5p^4}{8m^3n^2}$ B) $\frac{5}{8m^3n^2p^4}$ C) $\frac{8p^4}{5m^3n^2}$ D) $\frac{4096p^4}{125m^3n^2}$

3) $(-7x^{-2})(7x^{-4})$ 3) _____

A) $49x^8$ B) $-49x^8$ C) $-49x^6$ D) $\frac{-49}{x^6}$

4) $(x^{-5}y^6)^{-2}$ 4) _____

A) $\frac{x^{-7}}{y^4}$ B) $\frac{y^4}{x^{-7}}$ C) $\frac{x^{10}}{y^{12}}$ D) $\frac{1}{x^{10}y^{12}}$

5) $\left(\frac{7x^{-1}}{5y^{-1}}\right)^{-2}$ 5) _____

A) $\frac{49x^{12}}{25y^{12}}$ B) $\frac{25x^2}{49y^2}$ C) $\frac{49x^2}{25y^2}$ D) $\frac{25y^2}{49x^2}$

Express the number in scientific notation.

6) 0.000074 6) _____

A) 7.4×10^6 B) 7.4×10^5 C) 7.4×10^{-6} D) 7.4×10^{-5}

Solve the equation.

7) $8y + 4(2 + y) = 3(y - 4) + 10y$ 7) _____

A) -20 B) 20 C) -6 D) 6

8) $\frac{2}{5}x - \frac{1}{3}x = 3$ 8) _____

A) 45 B) -45 C) -90 D) 90

Solve the equation for y.

9) $2x + 5y = 9x + 4$ 9) _____

A) $y = \frac{5}{7}x - \frac{4}{7}$ B) $y = \frac{11}{5}x + \frac{4}{5}$ C) $y = \frac{7}{5}x + \frac{4}{5}$ D) $y = 7x + 11$

Solve the equation for the indicated variable.

10) $S = 2\pi rh + 2\pi r^2$, for h

10) _____

A) $h = \frac{S - 2\pi r^2}{2\pi r}$ B) $h = S - r$ C) $h = 2\pi(S - r)$ D) $h = \frac{S}{2\pi r} - 1$

Solve the inequality.

11) $5 - 3(1 - x) \leq 20$

11) _____

A) $x \leq 7$ B) $x \geq 6$ C) $x < 6$ D) $x \leq 6$

Solve the inequality and give the solution in interval notation.

12) $-17 \leq -3x + 1 < -11$

12) _____

A) (4, 6] B) [-6, -4) C) [4, 6) D) (-6, -4]

Find the solution set for the equation.

13) $|6m + 8| + 2 = 9$

13) _____

A) $\{-\frac{1}{6}, -\frac{5}{2}\}$ B) $\{\frac{1}{6}, \frac{5}{2}\}$ C) $\{\}$ D) $\{-\frac{1}{8}, -\frac{15}{8}\}$

Find the solution set for the inequality.

14) $|2m + 8| < 9$

14) _____

A) $\{m \mid -\frac{17}{2} < m < \frac{1}{2}\}$ B) $\{m \mid -\frac{1}{2} < m < \frac{17}{2}\}$

C) $\{m \mid m < -\frac{1}{2} \text{ or } m > \frac{17}{2}\}$ D) $\{m \mid m < -\frac{17}{2} \text{ or } m > \frac{1}{2}\}$

15) $|8m + 2| + 4 \geq 9$

15) _____

A) $\{m \mid -\frac{7}{8} \leq m \leq \frac{3}{8}\}$ B) $\{m \mid -\frac{3}{8} \leq m \leq \frac{7}{8}\}$

C) $\{m \mid m \leq -\frac{7}{8} \text{ or } m \geq \frac{3}{8}\}$ D) $\{m \mid m \leq -\frac{3}{8} \text{ or } m \geq \frac{7}{8}\}$

Find the solution set for the equation.

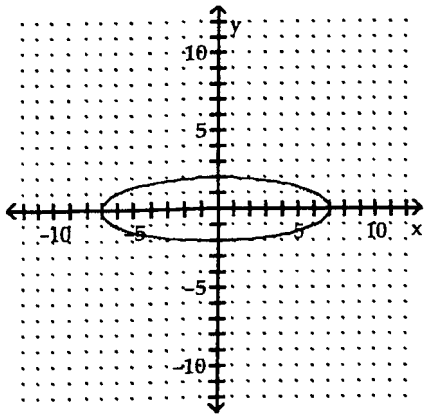
16) $|8s + 3| = |s - 4|$

16) _____

A) $\{\}$ B) $\{1, -\frac{1}{9}\}$ C) $\{-1, \frac{10}{9}\}$ D) $\{-1, \frac{1}{9}\}$

Determine whether the graph illustrated represents a function. Give the domain and range of the relation or function.

17) 17)



A) function
domain: $\{y \mid -2 \le y \le 2\}$
range: $\{x \mid -7 \le x \le 7\}$

B) function
domain: $\{x \mid -7 \le x \le 7\}$
range: $\{y \mid -2 \le y \le 2\}$

C) not a function
domain: $\{x \mid -7 \le x \le 7\}$
range: $\{y \mid -2 \le y \le 2\}$

D) not a function
domain: $\{y \mid -2 \le y \le 2\}$
range: $\{x \mid -7 \le x \le 7\}$

Evaluate the function for the indicated value.

18) $f(x) = x^2 + 3x - 6$; find $f(-3)$ 18) _____

A) 6 B) 24 C) 12 D) -6

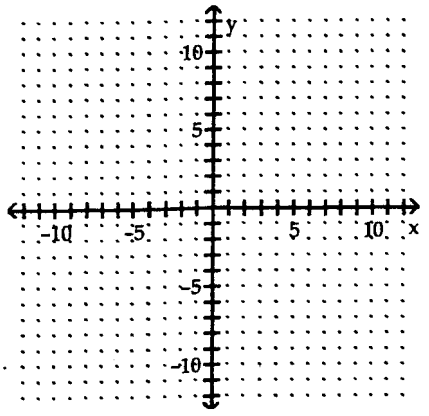
Solve the system of equations using the addition method.

19) $2x + 9y = -49$ 19) _____
$8x + 3y = 35$

A) (-3, 7) B) (8, -8) C) (7, -7) D) (-7, 7)

Graph the linear function by plotting the x- and y-intercepts.

20) $-5x - 30y = 30$ 20)



Solve the problem.

21) Linda needs to have her car towed. Little Town Auto charges a flat fee of $40 plus $2 per mile towed. Write a function expressing Linda's towing cost, c, in terms of miles towed, x. Find the cost of having a car towed 8 miles. 21) _____

A) $c(x) = 2x$; $16
B) $c(x) = 2x + 40$; $56
C) $c(x) = 2x + 40$; $46
D) $c(x) = 2 + 40$; $42

Find the slope of the line through the given points. If the slope is undefined, so state.

22) (5, -5) and (-2, 5) 22) _____

A) $-\frac{10}{7}$ B) $\frac{7}{10}$ C) $\frac{10}{7}$ D) $-\frac{7}{10}$

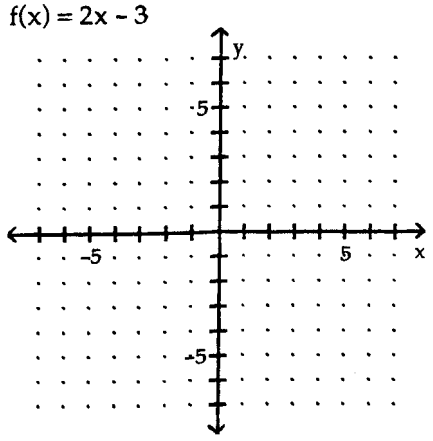
Determine the slope and the y-intercept of the graph of the equation.

23) $9x - 11y - 99 = 0$ 23) _____

A) $m = \frac{11}{9}$; (0, 11) B) $m = -\frac{9}{11}$; (0, 9) C) $m = 9$; (0, 99) D) $m = \frac{9}{11}$; (0, -9)

Use the slope and y-intercept to graph the function.

24) $f(x) = 2x - 3$ 24)



Simplify.

25) $(-5x^2 + 9x - 4) - (-2x^2 - 5x + 3)$ 25) _____

A) $-3x^2 + 4x - 1$ B) $-3x^2 + 14x - 7$ C) $-3x^4 + 14x^2 - 7$ D) $-7x^2 + 4x - 1$

Multiply the polynomials.

26) $(x - 11)(x^2 + 9x - 5)$ 26) _____

A) $x^3 - 2x^2 - 94x - 55$ B) $x^3 - 2x^2 - 104x + 55$

C) $x^3 + 20x^2 + 94x - 55$ D) $x^3 + 20x^2 + 104x + 55$

Multiply.

27) $(5x - 11y)^2$ 27) _____

A) $25x^2 + 121y^2$ B) $25x^2 - 110xy + 121y^2$

C) $5x^2 + 121y^2$ D) $5x^2 - 110xy + 121y^2$

28) $(9x + 5y)(9x - 5y)$ 28) _____

A) $81x^2 + 90xy - 25y^2$ B) $81x^2 - 90xy - 25y^2$

C) $81x^2 - 25y^2$ D) $81x^2 + 25y^2$

Use synthetic division to divide.

29) $(6r^3 - 40r^2 - 11r - 21) \div (r - 7)$ 29) _____

A) $6r^2 - 2r - 3$ B) $6r^2 + 2r + \frac{3}{r-7}$ C) $r^2 + 3r + 2$ D) $6r^2 + 2r + 3$

Factor.

30) $x^3 + 2x^2 + 3x + 6$ 30) _____

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

31) $125x^3 - y^3$ 31) _____

A) $(5x - y)(25x^2 + y^2)$ B) $(5x + y)(25x^2 - 5xy + y^2)$

C) $(125x - y)(x^2 + 5xy + y^2)$ D) $(5x - y)(25x^2 + 5xy + y^2)$

Factor the polynomial completely. If the polynomial is prime, so state.

32) $x^4 - 24x^2 - 25$ 32) _____

A) $(x - 5)^2(x^2 + 1)$ B) $(x + 5)(x - 5)(x + 1)(x - 1)$

C) $(x^2 - 25)(x^2 + 1)$ D) $(x + 5)(x - 5)(x^2 + 1)$

Determine whether the two given lines are parallel, perpendicular, or neither.

33) $6x - 3y = 12$ 33) _____

$y = 2x - 5$

A) parallel B) perpendicular C) neither

Find the requested value.

34) $f(x) = 3x^2 + 6$, $g(x) = x + 7$ 34) _____

Find $f(1) - g(1)$.

A) 15 B) -10 C) 3 D) 1

Solve the equation.

35) $x^2 - 9 = 8x$ 35) _____

A) -3, 3 B) -1, 9 C) 1, -9 D) -3, -3

Determine the domain of the function.

36) $f(x) = \dfrac{2x^2 - 4}{3x^2 + 6x - 45}$ 36) _____

A) $\{x \mid x \neq 3, x \neq -3, \text{ and } x \neq -5\}$ B) $\{x \mid x \neq -3 \text{ and } x \neq 5\}$

C) $\{x \mid x \text{ is a real number}\}$ D) $\{x \mid x \neq 3 \text{ and } x \neq -5\}$

Multiply.

37) $\dfrac{x^2 + 8x + 16}{x^2 + 9x + 20} \cdot \dfrac{x^2 + 5x}{x^2 - 3x - 28}$ 37) _____

A) $\dfrac{x(x + 5)}{x - 7}$ B) $\dfrac{x}{x - 7}$ C) $\dfrac{1}{x - 7}$ D) $\dfrac{x}{x^2 + 9x + 20}$

Divide.

38) $\dfrac{x^2 - 6x + 9}{8x - 24} \div \dfrac{12x - 36}{96}$ 38) _____

A) 96 B) $\dfrac{(x - 3)^2}{64}$ C) $\dfrac{x^2 - 6x + 9}{(x - 3)^2}$ D) 1

Add or subtract.

39) $\frac{x}{x^2-25}+\frac{5}{x+5}-\frac{6}{x}$ 39) _____

A) $\frac{-25(x-6)}{x(x+5)(x-5)}$ B) $\frac{25(x-6)}{(x+5)(x-5)}$ C) $\frac{6x^2-25x+150}{x(x+5)(x-5)}$ D) $\frac{25(x+6)}{x(x+5)(x-5)}$

Simplify.

40) $\frac{4+\frac{2}{x}}{\frac{x}{4}+\frac{1}{8}}$ 40) _____

A) 16 B) 1 C) $\frac{x}{16}$ D) $\frac{16}{x}$

Solve the equation and check your solution.

41) $\frac{1}{x}+\frac{1}{x+6}=\frac{x+7}{x+6}$ 41) _____

A) $x=6, x=1$ B) $x=1$ C) $x=-6, x=-1$ D) $x=-6, x=1$

Write the expression in exponential form. Assume that all variables represent positive real numbers.

42) $\sqrt[3]{5x^8y^4}$ 42) _____

A) $(5x^8y^4)^{1/3}$ B) $(5x^8y^4)^3$ C) $(\frac{5}{3}x^8y^4)^3$ D) $(\frac{5}{3}x^8y^4)^{1/3}$

Simplify the radical expression. Write the answer in radical form when appropriate.

43) $\sqrt[4]{x^{20}}$ 43) _____

A) x^{-5} B) x^4 C) x^{16} D) x^5

Evaluate if possible. If the expression is not a real number, so state.

44) $243^{4/5}$ 44) _____

A) 6561 B) 2187 C) 81 D) 19,683

Simplify the radical expression. Assume that all variables represent positive real numbers.

45) $\sqrt{3a}-5\sqrt{108a}+3\sqrt{75a}$ 45) _____

A) $-14\sqrt{186a}$ B) $-2\sqrt{3a}$ C) $-2\sqrt{186a}$ D) $-14\sqrt{3a}$

Rationalize the denominator. Assume all variables represent positive real numbers.

46) $\frac{7}{\sqrt{5}+2}$ 46) _____

A) $\frac{7\sqrt{5}+14}{10}$ B) $7\sqrt{5}-14$ C) $7\sqrt{5}-2$ D) $7\sqrt{5}+14$

Solve and check your solution(s). If the equation has no real solution, so state.

47) $\sqrt{6x-5}=5$ 47) _____

A) 5 B) $\frac{25}{6}$ C) $\frac{10}{3}$ D) 25

Add or subtract.

48) $(9 + 4i) - (-3 + i)$ 48) _____

A) $6 + 5i$ B) $12 - 3i$ C) $-12 - 3i$ D) $12 + 3i$

Solve the equation by the quadratic formula.

49) $4x^2 = -6x - 1$ 49) _____

A) $x = \frac{-3 \pm \sqrt{13}}{4}$ B) $x = \frac{-3 \pm \sqrt{5}}{8}$ C) $x = \frac{-3 \pm \sqrt{5}}{4}$ D) $x = \frac{-6 \pm \sqrt{5}}{4}$

Write the equation in logarithmic form.

50) $5^2 = 25$ 50) _____

A) $\log_2 25 = 5$ B) $\log_{25} 5 = 2$ C) $\log_5 25 = 2$ D) $\log_5 2 = 25$

Solve the equation and check your solution.

51) $\frac{x - 9}{3} = \frac{x + 3}{9}$ 51) _____

A) $x = 2$ B) $x = 15$ C) $x = \frac{10}{3}$ D) $x = 3$

Solve the formula for the indicated variable.

52) $\frac{1}{p} + \frac{1}{q} = \frac{1}{f}$ for q (optics) 52) _____

A) $q = \frac{1}{pf}$ B) $q = pf - \frac{1}{p}$ C) $q = -\frac{fp}{f - p}$ D) $q = \frac{1}{f} - p$