Review What You Know

Name_____

Evaluate the algebraic expression for the given value or values of the variable(s).

1) $\frac{8(x - 5)}{2x + 2}$; $x = 7$ 1) _____

A) 2 B) 6 C) $-\frac{3}{2}$ D) 1

Solve.

2) If a rock falls from a height of 100 meters above the ground, the height H (in meters) after x seconds can be approximated using the formula $H = 100 - 4.9x^2$. What is the height of the rock after 4 seconds? 2) _____

A) 21.6 m B) −284.16 m C) 80.4 m D) 1521.6 m

Find the intersection of the two sets.

3) $\{1, 7, 5, 8\} \cap \{5, 11, 1\}$ 3) _____

A) ∅ B) {1, 5} C) {1, 5, 8, 7, 11} D) {1}

Find the union of the two sets.

4) $\{1, 11\} \cup \{1, 5, 9\}$ 4) _____

A) {5, 9, 11} B) ∅ C) {1} D) {1, 5, 9, 11}

Determine whether the statement is true or false.

5) $-30 < 0$ 5) _____

A) True B) False

Rewrite the expression without absolute value bars.

6) $||-4| - |-5||$ 6) _____

A) 1 B) −1 C) −9 D) 9

Express the distance between the given numbers using absolute value. Then find the distance by evaluating the absolute value expression.

7) −27.4 and 16.3 7) _____

A) $|16.3 - (-27.4)| = -11.1$ B) $|-27.4 + (-16.3)| = 11.1$

C) $|-27.4 - 16.3| = 43.7$ D) $|16.3 + (-27.4)| = -43.7$

State the name of the property illustrated.

8) $8 + (-3) = (-3) + 8$ 8) _____

A) Distributive property of multiplication over addition

B) Identity property of addition

C) Commutative property of addition

D) Associative property of addition

9) $18 \cdot (3 + 9) = 18 \cdot 3 + 18 \cdot 9$ 9) _____

A) Commutative property of multiplication

B) Commutative property of addition

C) Distributive property of multiplication over addition

D) Associative property of multiplication

10) $25 + (8 + 13) = (25 + 8) + 13$ 10) _____

A) Commutative property of addition
B) Distributive property of multiplication over addition
C) Associative property of addition
D) Identity property of addition

11) $(3 + 4) + 8 = (4 + 3) + 8$ 11) _____

A) Distributive property of multiplication over addition
B) Associative property of addition
C) Inverse property of addition
D) Commutative property of addition

Simplify the algebraic expression.

12) $(8z + 11) - (4z - 1)$ 12) _____

A) $12z + 12$ B) $4z + 12$ C) $4z - 12$ D) $4z + 10$

Simplify the exponential expression.

13) $(9x^7)(-8x^5)$ 13) _____

A) $72x^{35}$ B) $72x^{12}$ C) $-72x^{35}$ D) $-72x^{12}$

14) $\frac{54x^{12}y^{10}z^5}{9x^7y^4z^4}$ 14) _____

A) $6x^5y^6z$ B) $6x^4y^5z$ C) x^5y^6z D) $6x^5y^6$

15) $-6y^0$ 15) _____

A) -5 B) 0 C) -6 D) 1

16) $\frac{x^5y^{-7}}{z^{-8}}$ 16) _____

A) $\frac{y^7}{x^5z^8}$ B) $\frac{x^5z^8}{y^7}$ C) $\frac{z^8}{x^5y^7}$ D) $\frac{x^5z^7}{y^8}$

17) $(x^9)^{-6}$ 17) _____

A) $-x^{54}$ B) $\frac{1}{x^{54}}$ C) $-6x^9$ D) $-6x^{54}$

18) $(3x^{-9}y^4z^{-3})^{-4}$ 18) _____

A) $\frac{x^{36}z^{12}}{-12y^{-16}}$ B) $\frac{y^8}{-12x^{13}z^7}$ C) $\frac{x^{36}z^{12}}{81y^{16}}$ D) $\frac{y^8}{81x^{13}z^7}$

19) $\left(\frac{3x^3}{y^2}\right)^{-3}$ 19) _____

A) $\frac{y^2}{27x^9}$ B) $\frac{y^6}{27x^9}$ C) $\frac{27y^6}{x^9}$ D) $\frac{27x^9}{y^6}$

Simplify the exponential expression. Assume that variables represent nonzero real numbers.

20) $\frac{2^{-8}x^{-4}y^2}{2^{-5}x^{-7}y^4}$ 20) _____

A) $\frac{x^3}{8y^2}$ B) $\frac{8}{x^3y^2}$ C) $\frac{3x^3}{y^2}$ D) $\frac{1}{8x^7y^2}$

Evaluate the expression or indicate that the root is not a real number.

21) $\sqrt{144 + 25}$ 21) _____

A) 17 B) 169 C) $\sqrt{119}$ D) 13

22) $\sqrt{144} + \sqrt{25}$ 22) _____

A) 13 B) 17 C) 169 D) $\sqrt{119}$

Use the product rule to simplify the expression.

23) $\sqrt{2x^2} \cdot \sqrt{6x}$ 23) _____

A) $2|x|\sqrt{3x^2}$ B) $2|x|\sqrt{3}$ C) $2|x|\sqrt{3x}$ D) $2x^2\sqrt{3x}$

Solve the problem.

24) The formula $v = \sqrt{20L}$ can be used to estimate the speed of a car, v, in miles per hour, based on the length, L, in feet, of its skid marks upon sudden braking on a dry asphalt road. If a car is involved in an accident and its skid marks measure 125 feet, at what estimated speed was the car traveling when it applied its brakes just prior to the accident? 24) _____

A) 55 miles per hour B) 60 miles per hour
C) 50 miles per hour D) 45 miles per hour

Use the quotient rule to simplify the expression.

25) $\frac{\sqrt{56x^4}}{\sqrt{2x}}$ 25) _____

A) $56x^3$ B) $2|x|\sqrt{7x}$ C) $\frac{x^2\sqrt{56}}{2}$ D) $2|x|\sqrt{x}$

Add or subtract terms whenever possible.

26) $\sqrt{9} + \sqrt{72} + \sqrt{64} + \sqrt{98}$ 26) _____

A) $\sqrt{72} + \sqrt{98} + 11$ B) $85\sqrt{2} + 11$
C) $13\sqrt{2} + \sqrt{9} + \sqrt{64}$ D) $13\sqrt{2} + 11$

Rationalize the denominator.

27) $\frac{2}{5 - \sqrt{10}}$ 27) _____

A) $\frac{10 - 2\sqrt{10}}{15}$ B) $\frac{2}{5} - \frac{2}{\sqrt{10}}$ C) $\frac{10 + 2\sqrt{10}}{15}$ D) $\frac{10 + 2\sqrt{10}}{5}$

Simplify using properties of exponents.

28) $(6x^{2/3})(9x^{1/2})$ 28) _____

A) $54x^{1/2}$ B) $54x^{7/6}$ C) $54x^{7/5}$ D) $54x^{2/3}$

Perform the indicated operations. Write the resulting polynomial in standard form.

29) $(2x^2 + 4x + 7) + (2x^2 + 8x + 8) - (5x + 2)$ 29) _____

A) $4x^2 + 7x + 17$ B) $2x^2 + 7x + 13$ C) $2x^2 + 7x + 17$ D) $4x^2 + 7x + 13$

Find the product.

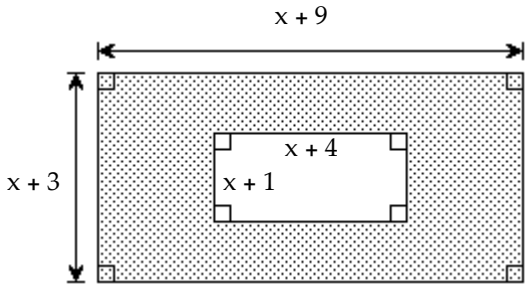
30) $(x + 3)(8x^2 + 4x + 7)$ 30) _____

A) $8x^3 + 28x^2 + 19x + 21$ B) $32x^3 + 16x^2 + 28x$

C) $8x^3 + 24x^2 + 12x + 21$ D) $96x^4 + 8x^3 + 84x^2 + 21$

Solve the problem.

31) Write a polynomial in standard form that represents the area of the shaded region. 31) _____



A) $17x + 31$ B) $x^2 + 22x + 23$ C) $7x + 23$ D) $-7x - 23$

Perform the indicated operations.

32) $(9x^4y^2 + 5x^3y + 6y) - (11x^4y^2 + 10x^3y + 2y + 4x)$ 32) _____

A) $-2x^4y^2 + 5x^3y + 4y - 4x$ B) $-2x^4y^2 - 5x^3y + 4y + 4x$

C) $20x^4y^2 + 15x^3y + 8y + 4x$ D) $-2x^4y^2 - 5x^3y + 4y - 4x$

Factor out the greatest common factor.

33) $x^2(x - 13) - (x - 13)$ 33) _____

A) $(x - 13)(x^2 + 1)$ B) $x^2(x - 13)$

C) $(x - 13)(x^2 - 1)$ D) $(x^3 - 13x^2) - (x - 13)$

Factor the trinomial, or state that the trinomial is prime.

34) $x^2 - 6x + 8$ 34) _____

A) $(x + 2)(x + 1)$ B) $(x - 2)(x - 4)$ C) $(x + 2)(x - 4)$ D) prime

35) $x^2 - x - 54$ 35) _____

A) $(x + 6)(x - 9)$ B) $(x - 6)(x + 9)$ C) $(x - 54)(x + 1)$ D) prime

36) $12x^2 + 25x + 12$ 36) _____

A) $(12x + 3)(x + 4)$ B) $(4x - 3)(3x - 4)$ C) $(4x + 3)(3x + 4)$ D) prime

Factor the difference of two squares.

37) $(16x^4 - 81)$ 37) _____

A) $(4x^2 + 9)(2x + 3)(2x - 3)$ B) $(2x + 3)^2(2x - 3)^2$

C) $(4x^2 + 9)(4x^2 + 9)$ D) $(4x^2 + 9)(4x^2 - 9)$

Find all numbers that must be excluded from the domain of the rational expression.

38) $\frac{x - 4}{x^2 - 16}$ 38) _____

A) $x \neq 16$ B) $x \neq \frac{1}{4}$ C) $x \neq 4, x \neq -4$ D) $x \neq 4$

Simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression.

39) $\frac{2x + 2}{10x^2 + 18x + 8}$ 39) _____

A) $\frac{2x + 5}{5x + 18}, x \neq -\frac{18}{5}$ B) $\frac{1}{5x + 4}, x \neq -\frac{4}{5}, x \neq -1$

C) $\frac{2x}{5x + 4}, x \neq -\frac{4}{5}$ D) $\frac{2x + 2}{10x^2 + 18x + 8}, x \neq -\frac{4}{5}, x \neq -1$

40) $\frac{x^2 + 6x + 9}{x^2 + 12x + 27}$ 40) _____

A) $\frac{6x + 1}{12x + 3}, x \neq -\frac{1}{4}$ B) $\frac{x + 3}{x + 9}, x \neq -9, -3$

C) $-\frac{x^2 + 6x + 9}{x^2 + 12x + 27}, x \neq -9, -3$ D) $\frac{6x + 9}{12x + 27}, x \neq -\frac{9}{4}$

Multiply or divide as indicated.

41) $\frac{6x - 2}{2x - 4} \cdot \frac{x - 2}{18x - 6}$ 41) _____

A) 6 B) $\frac{1}{6}$ C) $\frac{x - 2}{6(x + 2)}$ D) $\frac{1}{3}$

42) $\frac{x^2 + 15x + 56}{x^2 + x - 56} \cdot \frac{x^2 - 64}{x^2 - x - 56}$ 42) _____

A) $\frac{x + 8}{x - 7}$ B) $\frac{x + 7}{x - 8}$ C) $\frac{x - 8}{x + 7}$ D) $\frac{x - 8}{x - 7}$

43) $\frac{4x + 8}{15} \div \frac{3x + 6}{6}$ 43) _____

A) $\frac{7x + 14}{21}$ B) $\frac{4x + 8}{45x}$ C) $\frac{2}{15}$ D) $\frac{8}{15}$

44) $\frac{(x+3)^2}{x-3} \div \frac{x^2-9}{3x-9}$ 44) _____

A) $\frac{(x+3)^2}{(x-3)^2}$ B) $\frac{(x+3)^3}{3(x-3)}$ C) $\frac{6(x^2+9)}{x^2-9}$ D) $\frac{3(x+3)}{x-3}$

45) $\frac{x^2+8x+15}{x^2+9x+18} \div \frac{x^2+5x}{x^2+10x+24}$ 45) _____

A) $\frac{x}{x^2+9x+18}$ B) $\frac{x+4}{x}$ C) $\frac{x+4}{x^2+6x}$ D) $x+4$

Add or subtract as indicated.

46) $\frac{3x+1}{3x+4} + \frac{3x+7}{3x+4}$ 46) _____

A) 2 B) $\frac{2}{3x+4}$ C) 1 D) $\frac{4x+5}{3x+4}$

47) $\frac{2}{x^2-3x+2} + \frac{7}{x^2-1}$ 47) _____

A) $\frac{9x-12}{(x-1)(x-2)}$ B) $\frac{12x-9}{(x-1)(x+1)(x-2)}$

C) $\frac{9x-12}{(x-1)(x+1)(x-2)}$ D) $\frac{28x-12}{(x-1)(x+1)(x-2)}$

48) $\frac{x+5}{x^2+11x+28} + \frac{2x+1}{x^2+10x+21}$ 48) _____

A) $\frac{3x^2+17x+19}{(x-7)(x-4)(x-3)}$ B) $\frac{3x^2+17x+19}{(x+7)(x+4)(x+3)}$

C) $3x+6$ D) $\frac{3x+6}{2x^2+21x+49}$

Simplify the complex rational expression.

49) $\frac{\frac{x}{7}-1}{x-7}$ 49) _____

A) $\frac{7}{x-7}$ B) -7 C) $x-7$ D) $\frac{1}{7}$

50) $\frac{\frac{4}{x^2-4x-32} - \frac{1}{x-8}}{\frac{1}{x+4}+1}$ 50) _____

A) $\frac{x}{x^2-5x-40}$ B) $-\frac{x}{x^2-4x-32}$ C) -1 D) $-\frac{x}{x^2-3x-40}$