

Review Packet MAT430

Name _____

Identify the polynomial as a monomial, binomial, or trinomial; then state its degree.

1) $\sqrt{2}x - \sqrt{3}$

Perform the indicated operations and simplify.

2) $(12x - 7) - (5x - 12)$

3) $2(2 - 5t) + t^2(t - 1) - (t^4 - 1)$

4) $\sqrt{x}(x - \sqrt{x})$

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

6) $(1 + a^3)^3$

Factor the polynomial completely.

7) $-2x^3 + 16x$

8) $2(a + b)^2 + 5(a + b) - 3$

9) $8s^3 + 125t^6$

10) $2x^3 + x^2 - 6x - 3$

11) $(x^2 + 1)^{\frac{1}{2}} + 2(x^2 + 1)^{-\frac{1}{2}}$

12) $y^4(y + 2)^3 + y^5(y + 2)^4$

Find the domain of the expression.

13) $\sqrt{x+3}$

Simplify the rational expression.

14) $\frac{x^2 - x - 12}{x^2 + 5x + 6}$

Perform the multiplication or division and simplify.

15) $\frac{x^2 + 2x - 3}{x^2 - 2x - 3} \cdot \frac{3 - x}{3 + x}$

16) $\frac{\frac{x^3}{x+1}}{\frac{x}{x^2 + 2x + 1}}$

Perform the addition or subtraction and simplify.

17) $\frac{2}{a^2} - \frac{3}{ab} + \frac{4}{b^2}$

18) $\frac{1}{x^2 + 3x + 2} - \frac{1}{x^2 - 2x - 3}$

Simplify the compound fraction.

19) $\frac{x^{-1} + y^{-1}}{(x + y)^{-1}}$

Simplify the rational expression.

20) $\frac{\frac{1}{a+h} - \frac{1}{a}}{h}$

21) $\frac{(1-x^2)^{\frac{1}{2}} + x^2(1-x^2)^{\frac{-1}{2}}}{1-x^2}$

Rationalize the expression.

$$22) \sqrt{x^2+1} - x$$

Solve the equation for the indicated variable.

$$23) \frac{ax+b}{cx+d} = 2; \text{ for } x$$

$$24) a^2x + (a-1) = (a+1)x; \text{ for } x$$

Find all real solutions of the equation.

$$25) \frac{10}{x} - \frac{12}{x-3} + 4 = 0$$

$$26) 2x^2 + 8x + 1 = 0$$

$$27) 6x(x-1) = 21 - x$$

$$28) \sqrt{6x^2 + 2x} - \sqrt{\frac{3}{2}} = 0$$

$$29) 2x + \sqrt{x+1} = 8$$

$$30) |x-4| = 0.01$$

$$31) 2x^4 + 4x^2 + 1 = 0$$

$$32) x^{\frac{4}{3}} - 5x^{\frac{2}{3}} + 6 = 0$$

Solve the linear inequality. Express the solution using interval notation.

$$33) \frac{1}{3}x + 2 < \frac{1}{6}x - 1$$

$$34) 2(7x-3) \leq 12x+16$$

$$35) 2 \leq x+5 < 4$$

$$36) \frac{1}{6} < \frac{2x-13}{12} \leq \frac{2}{3}$$

Solve the nonlinear inequality. Express the solution using interval notation.

37) $(x-5)(x+4) \geq 0$

38) $x(2x+7) \geq 0$

39) $3x^2 - 3x < 2x^2 + 4$

40) $x^3 - 4x > 0$

41) $-2x^2 \leq 4$

42) $-2 < \frac{x+1}{x-3}$

43) $\frac{3}{x-1} - \frac{4}{x} \geq 1$

44) $\frac{1}{x+1} + \frac{1}{x+2} \leq 0$

Solve the absolute value inequality. Express the answer using interval notation.

45) $\frac{1}{2}|x| \geq 1$

46) $|x-5| \leq 3$

47) $\left| \frac{x+1}{2} \right| \geq 4$

48) $8 - |2x-1| \geq 6$

Find the slope of the line through P and Q.

49) $P(1, -3), Q(-1, 6)$

Find an equation of the line that satisfies the given conditions. Write your answer in Linear Equation form.

50) Through (2,3); slope 1

51) Through (2,1) and (1,6)

52) x-intercept 1; y-intercept -3

53) Through (1,-6); parallel to the line $x + 2y = 6$

54) Through (-1,-2); perpendicular to the line $2x + 5y + 8 = 0$

55) Through (-2,-11); perpendicular to the line passing through (1,1) and (5,-1)

Find all real solutions of the equation.

56) $x^2 + 3x - \frac{7}{4} = 0$

57) $\frac{3}{x+1} - \frac{1}{2} = \frac{1}{3x+3}$

58) $\sqrt{5-x} + 1 = x - 2$

Find the radian measure of the angle with the given degree measure.

59) -45°

60) 7.5°

Find the degree measure of the angle with the given radian measure.

61) $-\frac{5\pi}{4}$

62) -1.2

Find an angle between 0 and 2π that is co-terminal with the given angle.

63) $\frac{17\pi}{4}$

Find an angle between 0° and 360° that is co-terminal with the given angle.

64) -800°

Find the terminal point $P(x,y)$ on the unit circle determined by the given value of t .

65) $t = -\frac{\pi}{2}$

66) $t = \frac{11\pi}{6}$

Find (a) the reference number for each value of t , and (b) the terminal point $P(x,y)$ determined by t .

67) $t = \frac{3\pi}{4}$

68) $t = \frac{31\pi}{6}$

Find the exact value of each expression, if it is defined.

69) a) $\sin^{-1} 1$

b) $\cos^{-1} 1$

c) $\cos^{-1}(-1)$

70) a) $\tan^{-1} 1$

b) $\tan^{-1}(-1)$

c) $\tan^{-1} 0$

Find the amplitude and period for all functions. Identify any phase shifts (if any), and sketch the graph of the function over one period. Label vertical (V) and/or horizontal (H) phase shifts on your answer sheet.

$$71) y = -\frac{1}{2} \tan x$$

$$72) f(x) = 1 + \cos x$$

$$73) y = -3\sin 3x$$

$$74) y = 5\cos \frac{1}{4}x$$

Solve the triangle using the Law of Sines.

$$75) \angle A = 30^\circ, \angle C = 65^\circ, b = 10$$

$$76) a = 28, b = 15, \angle A = 110^\circ$$

Use the Law of Cosines to solve triangle ABC.

$$77) b = 60, c = 30, \angle A = 70^\circ$$

$$78) a = 50, b = 65, \angle A = 55^\circ$$

