**Review**

**Extra Practice**

1. Determine the domain of the variable $x$ for the expression $\frac{(x-1)}{(x-2)(x+5)}$.

2. Determine the domain of the variable $x$ for the expression $\frac{(x-1)}{(x-9)(x+6)}$.

3. Determine the domain of the variable $x$ for the expression $\frac{(x-1)}{(x-4)(x+8)}$.

4. Determine the domain of $y = \sqrt{x+64}$.

5. Determine the domain and range of $y = \sqrt{x-2} + 5$

6. Determine the domain and range of $y = \sqrt{x-7} + 9$

7. Find the distance $d(P_1, P_2)$ between the points $P_1 = (-5, -1)$ and $P_2 = (4, 3)$.

8. Find the distance $d(P_1, P_2)$ between the points $P_1 = (-5, 3)$ and $P_2 = (-4, 2)$.

Solve:

9. $\frac{(x-7)(x+5)}{x-4} \geq 0$

10. $\frac{(x-8)(x+2)}{x-1} \geq 0$

11. $\frac{(x-5)(x+6)}{x-3} \geq 0$

12. $\frac{(x-6)(x+1)}{x-2} \geq -5$

13. $\frac{x^2 - 8x}{x+1} < -4$

14. $\frac{x^2 - 6x}{x+4} \leq / \forall$

15. $\frac{(x-5)(x+8)}{x-2} > 6$

Factor:

16. $64b^3 - 125$

17. $27u^3 - 8$

18. $a^3 - 216$

19. $3x^4y^3 - 24x^4$

20. $5x^3y^3 - 135x^3$

21. $2x^2y^3 - 128x^2$
Find the discriminant:

22. \(4x^2 + 3x + 2 = 0\)
23. \(5x^2 - 2x + 5 = 0\)
24. Determine the nature of the roots:
   \(2x^2 - 4x + 6 = 0\)
25. Determine the nature of the roots:
   \(3x^2 - 24x + 48 = 0\)
26. Determine the nature of the roots:
   \(3x^2 + 5x + 3 = 0\)

Solve for \(t\) in the equation \(T = 8s^2 t\).

Solve for \(A\) in \(B = \frac{5}{8}(A - 8)\).

Solve for \(A\) in \(B = \frac{7}{8}(A - 12)\).

Solve for \(w\): \(5u - w = u - 6w\)

Solve for \(w\): \(4u - w = u + 3w\)

Solve for \(d\) in the equation \(A = 3c^2 + d\).

Solve for \(b\) in the equation \(S = 5a^2 b\).

Graph:

34. \(2x^2 + 2y^2 = 8\)
35. \(x^2 + y^2 = 16\)
36. Sketch the graph of \((x-5)^2 + (y+2)^2 = 9\).
37. Sketch the graph of \((x - 4)^2 + (y + 5)^2 = 4\).

40. Find the center and radius of \(x^2 + y^2 + 2x + 8y + 13 = 0\).

43. Leslie invested $2000 at 9%. What additional amount must she invest at 10% so that her annual interest is $750?

44. Jorge purchased some municipal bonds yielding 7% annually and some certificates of deposit yielding 10% annually. If Jorge's investment amounts to $17,000 and the annual income is $1580, how much is invested in bonds and how much is invested in certificates of deposit?

45. Martin purchased some municipal bonds yielding 8% annually and some certificates of deposit yielding 10% annually. If Martin's investment amounts to $12,000 and the annual income is $1000, how much is invested in bonds and how much is invested in certificates of deposit?

46. John has invested a certain amount of money in stocks and bonds. The annual return from these investments is $720. If the stocks produce $220 more in returns than the bonds, how much money does John receive annually from each type of investment?

47. Kim has invested a certain amount of money in stocks and bonds. The annual return from these investments is $635. If the stocks produce $185 more in returns than the bonds, how much money does Kim receive annually from each type of investment?

Solve:

48. \(x + 2\sqrt{x} - 3 = 0\)

49. \(x^4 + 3x^2 - 10 = 0\)

50. \(x - 5\sqrt{x} + 6 = 0\)
Solve:

51. \( x - 5\sqrt{x} - 14 = 0 \)

52. \( x^4 - 4x^2 - 5 = 0 \)

53. \( x^4 - 10x^2 + 24 = 0 \)

54. Find the average rate of change for 
   \( f(x) = 2x^2 + 3x \) from \(-2\) to \(6\).

55. Find the average rate of change for 
   \( f(x) = 3x^3 - 4x + 1 \) from \(-1\) to \(5\).

56. Find the average rate of change for 
   \( f(x) = -4x^2 + 3 \) from \(-7\) to \(-2\).

57. Find the difference quotient for 
   \( f(x) = 2x^2 - 3x \).

58. Find the difference quotient for 
   \( f(x) = 3x^3 + 1 \).

59. Find the difference quotient for 
   \( f(x) = -4x^2 - 3 \).