

Summer packet for CAL470 (Pre-Calculus / Trigonometry)

from the text: Precalculus: the mathematics for calculus (fifth edition) by Stewart, Redlin, and Watson

Students should complete the summer packet before the first day of class in August. The first few classes will cover questions about the packet. A test will be given during the second week of class.

name _____ block _____

Evaluate the expression. (fraction and radical answers preferred over decimal)

1. $|3 - |-9||$

2. $1 - |1 - |-1||$

3. $2^{-3} - 3^{-2}$

4. $\sqrt[3]{-125}$

5. $216^{-\frac{1}{3}}$

6. $64^{\frac{2}{3}}$

7. $\frac{\sqrt{242}}{\sqrt{2}}$

8. $\sqrt[4]{4} \cdot \sqrt[4]{324}$

9. $2^{\frac{1}{2}} \cdot 8^{\frac{1}{2}}$

10. $\sqrt{2} \cdot \sqrt{50}$

Simplify the expression.

11. $\frac{x^2(2x)^4}{x^3}$

12. $(a^2)^{-3}(a^3b)^2(b^3)^4$

13. $\left(\frac{r^2s^{\frac{4}{3}}}{\frac{1}{r^3s}}\right)^6$

14. $\sqrt[3]{(x^3y)^2y^4}$

15. $\sqrt{x^2y^4}$

16. $\left(\frac{9x^3y}{y^{-3}}\right)^{\frac{1}{2}}$

17. $\left(\frac{ab^2c^{-3}}{2a^3b^{-4}}\right)^{-2}$

Factor the expression completely.

18. $x^2 - 9x + 18$

19. $6x^2 + x - 12$

20. $4t^2 - 13t - 12$

21. $x^4 - 2x^2 + 1$

22. $25 - 16t^2$

23. $2y^6 - 32y^2$

24. $x^6 - 1$

25. $y^3 - 2y^2 - y + 2$

26. $3x^3 - 2x^2 + 18x - 12$

Perform the indicated operations and simplify.

27. $(2x + 1)(3x - 2) - 5(4x - 1)$

28. $(2y - 7)(2y + 7)$

29. $x^2(x - 2) + x(x - 2)^2$

30. $\frac{x^2 - 2x - 3}{2x^2 + 5x + 3}$

31. $\frac{x^2 + 2x - 3}{x^2 + 8x + 16} \cdot \frac{3x + 12}{x^2 - 1}$

32. $\frac{t^3 - 1}{t^2 - 1}$

33. $\frac{x^2 - 2x - 15}{x^2 - 6x + 5} \div \frac{x^2 - x - 12}{x^2 - 1}$

34. $\frac{2}{x} + \frac{1}{x-2} + \frac{3}{(x-2)^2}$

35. $\frac{1}{x-1} - \frac{2}{x^2-1}$

36. $\frac{\frac{1}{x} - \frac{1}{x+1}}{\frac{1}{1} + \frac{1}{x+1}}$

37. $\frac{\sqrt{6}}{\sqrt{3} + \sqrt{2}}$ (rationalize the denominator)

Find all real solutions of the equation.

38. $8 - 2x = 14 + x$

39. $\frac{x+1}{x-1} = \frac{3x}{3x-6}$

40. $x^2 - 9x + 14 = 0$

41. $2x^2 + x = 1$

42. $4x^3 - 25x = 0$

43. $3x^2 + 4x - 1 = 0$

44. $\frac{1}{x} + \frac{2}{x-1} = 3$

45. $\frac{x}{x-2} + \frac{1}{x+2} = \frac{8}{x^2-4}$

46. $|2x - 5| = 9$

Solve the inequality. Express the solution using interval notation and graph the solution set on the real number line.

47. $3x - 2 > -11$

48. $-1 < 2x + 5 \leq 3$

49. $x^2 + 4x - 12 > 0$

50. $\frac{x-4}{x^2-4} \leq 0$

51. $|x - 5| \leq 3$

52. $2|x + 3| - 5 > 7$

Solve the equation or inequality graphically.

53. $\sqrt{x+4} = x^2 - 5$

54. $x^3 - 4x^2 - 5x > 2$

Two points $P(7, -1)$ and $Q(2, -11)$ are given, perform the following in problems 55-58.

55. Find the distance from P to Q .

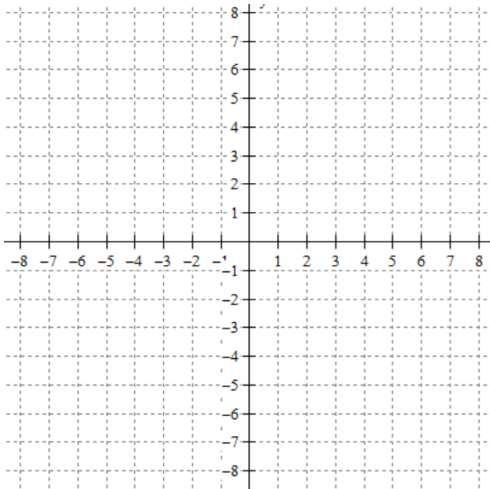
56. Find the midpoint of the segment PQ .

57. Find the equation of line PQ .

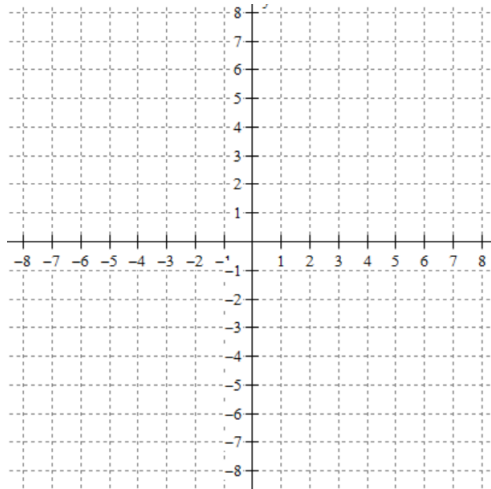
58. Find the equation of the circle with center P through the point Q .

Graph the following equations.

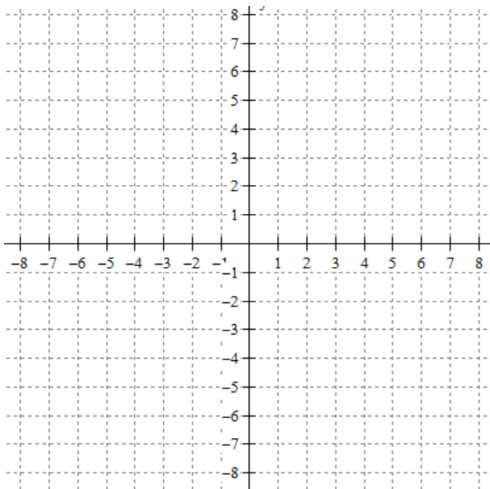
59. $y = -\frac{3}{4}x + 1$



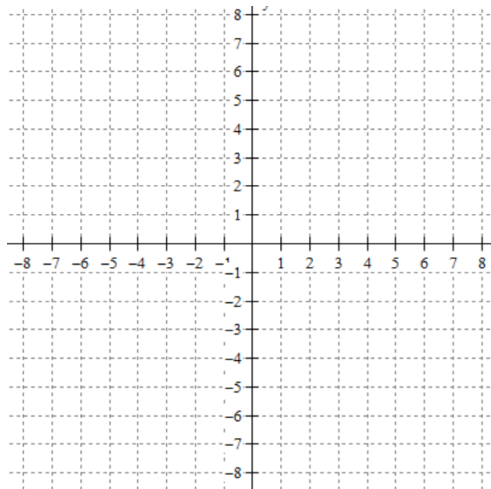
60. $y = 2x - 3$



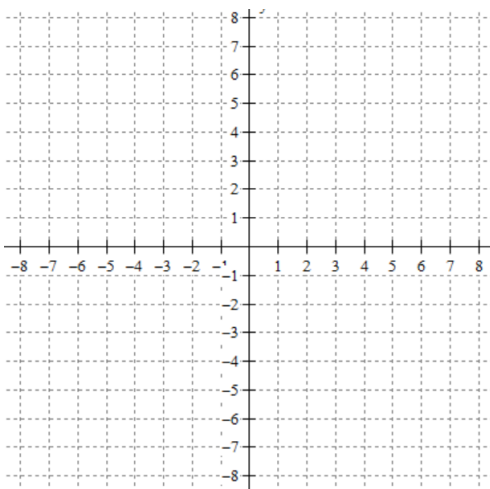
61. $y - 2 = -(x + 4)$



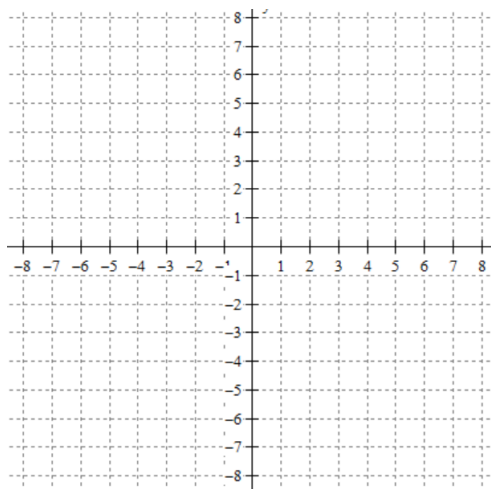
62. $y = -3x$



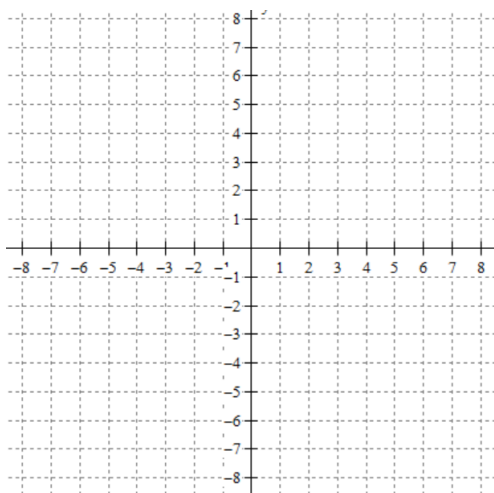
63. $2x + 3y = -12$



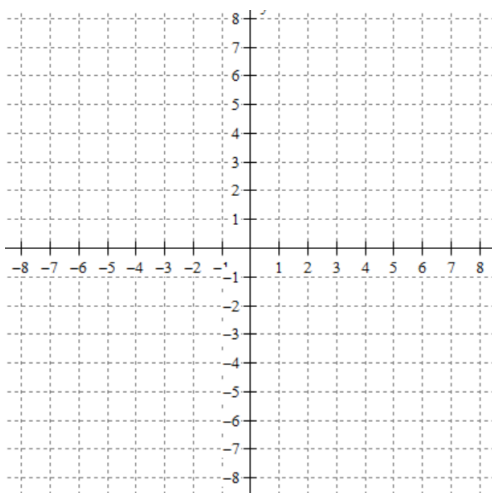
64. $3x - 4y = 12$



65. $x = 5$

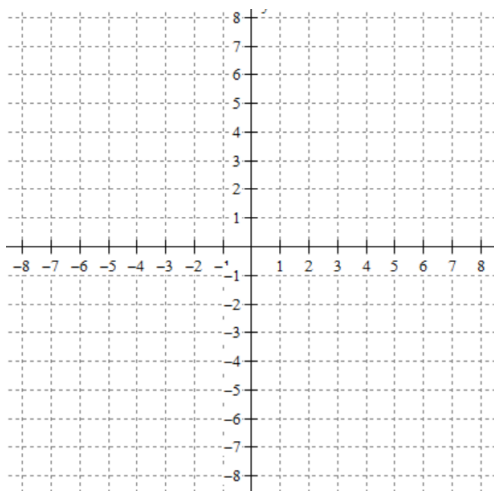


66. $y = -4$

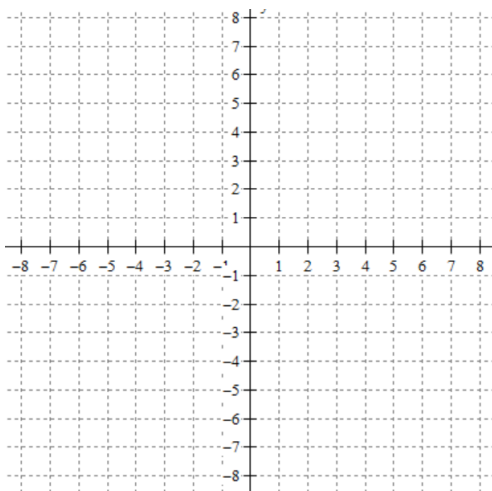


Graph the following inequalities.

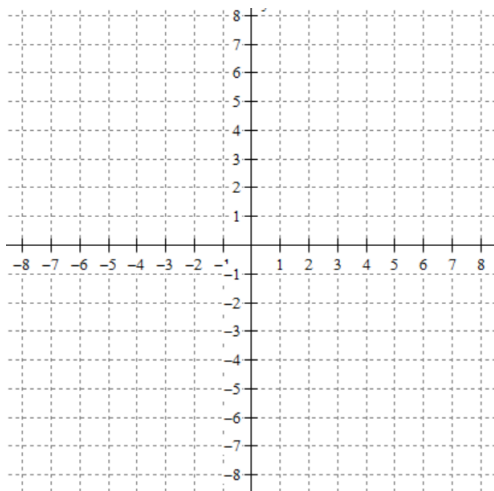
67. $y < -\frac{1}{3}x$



68. $x + y \geq 2$



69. $y > -5$



70. $x \leq 4$

