

Algebra II/Trigonometry Prerequisite Skills Summer Packet

Simplify each expression using $a = 3$, $b = -5$, $c = -2$, and $d = \frac{2}{3}$. Do this without a calculator.

1. $8a - \frac{1}{2}(2a^2 - bc)^2$

2. $\frac{(abcd)^2}{4b}$

3. $bd + \frac{4b}{a^3 + 3c^3}$

4. $3(4a - b - c^4)^3 + c$

5. $c + a \left[(a + 2c)^3 \div d - \frac{8}{3}a \right]^2$

Solve each equation. Leave all answers as an integer or a fraction. If the answer is a decimal, convert the decimal to a fraction. Do this without a calculator.

6. $9x - 5x - 19 = 21$

7. $9x - 19 = -5x + 21$

8. $\frac{4}{9}(2x - 4) = 48$

9. $-4(x - 3) = -x$

10. $8a - 4(-5a - 2) = 12a$

11. $-\frac{2}{5}x = 10$

12. $4.05x + 1.38 = 12(2.05 - 4.5x)$

13. $\frac{3}{4}(24 - 8b) = 2(5b + 1)$

14. Solve for y : $\frac{1}{5}(25 - 5y) = 4x - 9y + 13$

Solve each word problem completely.

15. Jamie ran around a track in 99 seconds. How long did it take him to run each lap of he ran the first lap at 8.5 m/s and the second at 8.0 m/s?
16. Raul works 2 hours daily after school, Monday through Friday. On Saturdays he works 8 hours at \$2 more per hour than on weekdays. If he makes \$142 per week, how much does he make per hour on weekdays?
17. Yolanda invests \$4000 in bank certificates and bonds. The certificates pay 5.5% interest and the bonds pay 11% interest. His interest income is \$352 this year. How much money was invested in bank certificates?
18. How many liters of water must be evaporated from 10 L of a 40% salt solution to produce a 50% solution?
19. A wholesaler has 100 kg of mixed nuts that sell for \$4.00/kg. In order to make the price more attractive, she plans to mix in some cheaper nuts worth \$3.20/kg. If the wholesaler wants to sell the mixture for \$3.40/kg, how many kilograms of the cheaper nuts should be used?
20. Phyllis can rake our lawn in 50 minutes, and I can do it in 40 minutes. If she rakes for 5 minutes before I join her, how much longer will it take us to finish working together?
21. A motorboat goes 36 km downstream in the same amount of time that it takes to go 24 km upstream. If the current is flowing at 3 km/h, what is the rate of the boat in still water?
22. Find the slope of the line between (-3, 4) and (-7, 2). Do not use graph paper.
23. Graph $\frac{1}{2}x = 6 + 3y$ using the x and y intercepts only (use graph paper).
24. Graph $2x + 5y = 15$ using the slope and y -intercept only (use graph paper).

25. Determine the equation of the lines that contains $(-1, 3)$ and $(1, 7)$ in slope-intercept form.
26. Determine the equation of the line parallel to $2x - 3y = 6$ and contains the point $(-3, 5)$ in slope-intercept form.
27. Determine the equation of the line perpendicular to $2x - 3y = 6$ and contains the point $(-3, 5)$ in standard form.
28. Solve the inequality and graph the solution on a number line.
 $|10 - 5x| - 45 \leq 0$
29. Graph $\frac{1}{2}x + \frac{2}{3}y < 10$ on graph paper.
30. Solve the system of equations.
 $3x = 12 + 2y$
 $\frac{1}{2}x - \frac{1}{2}y = 30$

31. Solve the system of equations.

$$\frac{3}{4}x = \frac{1}{4} - \frac{9}{4}y$$

$$3y = \frac{2}{3} - 2x$$

Simplify.

32. $\left(\frac{-3x^3y^{-5}}{9x^6y^{-8}}\right)^{-2}$

33. $\left(\frac{5xy}{8x^{-1}y^2}\right)^2 \left(\frac{24y^3}{5x^2y^5}\right)$

34. $(3x^3 + 2x^2 - 4) - (4x^3 - 4x + 5)$

35. Multiply $(2x - 5)(3x + 2)$

36. Multiply $\left(\frac{1}{8}x - 3y^2\right)\left(\frac{1}{4}x^2 + \frac{3}{2}xy^2 + 9y^4\right)$

Factor each polynomial.

37. $x^2 + 11x - 26$

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

39. $3x^2 - 17x + 10$

40. $6x^3 - 3x^2 - 18x$

41. $4x^2 - 100$

42. $3x^3 + 5x^2 - 12x - 20$

Simplify (no decimals).

43. $\sqrt{500x^6y^9}$

44. $(2 - 6\sqrt{3}) + (7 + 2\sqrt{3})$

45. $\frac{14\sqrt{3}}{\sqrt{2}}$

46. $(4 - 3\sqrt{2})^2$

47. $(2\sqrt{2} + 3\sqrt{5})(2\sqrt{2} - 3\sqrt{5})$

48. $\frac{4\sqrt{7}}{2 + \sqrt{3}}$

Solve each equation (no decimals).

49. $3x^2 - 7 = 2(x^2 + 3)$

50. $2x^3 + 7x^2 + 3x = 0$

51. $6x^2 = 2x + 5$

52. $\sqrt{x^2 + 1} = 1 - x$

53. Graph the parabola $y = 2x^2 + 4x - 6$ (on graph paper)

Simplify each rational expression.

54. $\frac{x^2 - 3x - 4}{x^2 - 13x + 36}$

55. $\frac{x^2 - 36}{2x^2 + 3x + 1} \div \frac{4x - 24}{8x + 4}$

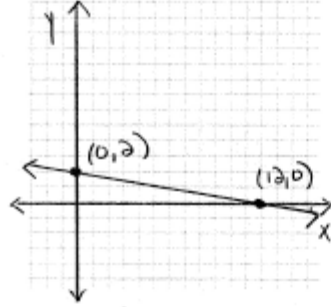
56. $\frac{6}{x+2} - \frac{1}{x+3}$

57. Solve $\frac{x}{x-3} - x = \frac{3x-4}{x-3}$

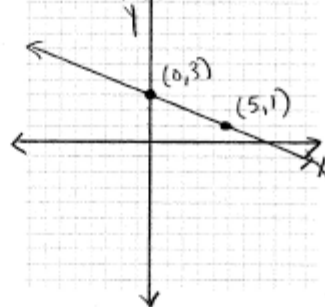
Answers

- 8
- 20
- 10
- 6589
- 191
- $x = 10$
- $x = \frac{20}{7}$
- $x = 56$
- $x = 4$
- $a = -\frac{1}{2}$
- $x = -25$
- $x = 0.4$
- $b = 1$
- $y = \frac{1}{2}x - 1$
- 48 sec, 51 sec
- \$7/hr
- \$1600
- 2 L
- 300 kg
- 20 min
- 15 km/hr
- $m = \frac{1}{2}$
- see attached
- see attached
- $y = 2x + 5$
- $y = \frac{2}{3}x + 7$
- $3x + 2y = 1$
- $9 \leq x \leq 13$
- see attached
- $(-108, -168)$
- $(\frac{1}{3}, 0)$
- $\frac{9x^6}{y^6}$
- $\frac{15x^2}{8y^4}$
- $-x^3 + 2x^2 + 8x - 9$
- $6x^2 - 11x - 10$
- $\frac{1}{8}x^3 - 27y^6$
- $(x+13)(x-2)$
- $(x-9)(x-2)$
- $(3x-2)(x-5)$
- $3x(2x+3)(x-2)$
- $4(x+5)(x-5)$
- $(3x+5)(x+2)(x-2)$
- $10x^3y^4\sqrt{5y}$
- $9 - 4\sqrt{3}$
- $7\sqrt{6}$
- $-2 - 24\sqrt{2}$
- 37
- $8\sqrt{7} - 4\sqrt{21}$
- $x = \pm\sqrt{13}$
- $x = 0, -\frac{1}{2}, -3$
- $x = \frac{1 \pm \sqrt{31}}{6}$
- $x = 0$
- see attached
- $\frac{x+1}{x-9}$
- $\frac{(x+6)(x+2)}{(2x+1)(x+1)}$
- $\frac{5x+16}{(x+2)(x+3)}$
- $x = \frac{1 \pm \sqrt{17}}{2}$

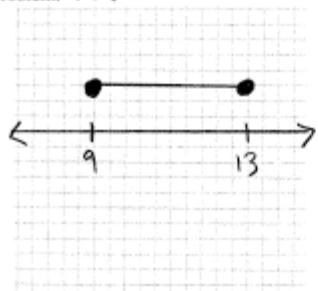
Problem: #23



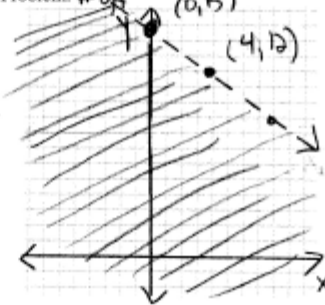
Problem: #24



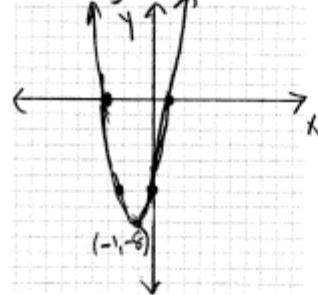
Problem: #28



Problem: #29



Problem: #53



Problem:

