

Practice Problems for Placement into Math 121 Intermediate Algebra

1. Simplify: $\frac{60-2^3-(3 \cdot 4)}{3^2-4 \cdot 5}$

2. Simplify: $\frac{-4+5(6-9)}{2-4^2}$

3. Simplify: $-|-10| - |6 - 11|$

4. Simplify: $-|(-9)(-2)| - 5|-4 - 3 \cdot 2|$

5. Solve: $-6(x - 3) - 4(3 - x) = -2$

6. Solve: $-5(t - 6) + 4(t - 3) = 7(4 - t) + 8t$

7. The perimeter of a football field is 340 yards. The length of the field is 30 yards less than three times the width. What are the dimensions of the field?

8. In the 2013 baseball season, the St. Louis Cardinals won 33 less than twice as many games as they lost. They played 162 regular-season games. How many wins and how many losses did the Cardinals have?

9. Solve the inequality: $-5t - 7 \leq 13$

10. Solve the inequality: $-4t - 10 > 15 + t$

11. Find the slope of the line passing through the points $(-3, 4)$ and $(-2, -5)$.

12. Find the slope of the line passing through the points $(-4, 3)$ and $(2, 3)$.

13. Write the equation of the line with slope $-\frac{1}{2}$ passing through the point $(4, -5)$.
14. Write the equation of the line parallel to the line $3x + 2y = 6$ and passing through the point $(6, -7)$.
15. Write the equation of the horizontal line through the point $(7, -5)$.
16. Find the y -intercept of the graph of the equation: $3x - 5y = 30$
17. Find the x -intercept of the graph of the equation: $5x - 3y = -15$
18. Simplify: $\left(\frac{x^4y^5x^6}{y^2}\right)^4$
19. Simplify and leave answer with positive exponents: $(2^{-3}x^4)^{-2}$
20. Simplify and leave answer with positive exponents: $\left(\frac{-3^{-2}x^5y^{-1}}{2x^{-3}y^2}\right)^{-1}$
21. A computer can perform 468,000,000 calculations per second. How many calculations can it perform in a minute? Write answer in scientific notation.
22. Pollux, one of the brightest stars in the night sky, is 33.7 light-years from earth. If one light-year is 6,000,000,000,000 miles, about how many miles is Pollux from earth? Write answer in scientific notation, rounding to two decimal places.
23. Subtract: $(-5t^2 + 3t - 7) - (4t^2 - 6t + 1)$
24. Subtract: $(-6m^2 + 9m - 11) - 2(5m^2 - 4m + 5)$

25. Perform the operation and simplify: $(3y + 5)^2$

26. Perform the operation and simplify: $(4k - 7)^2$

27. Divide: $\frac{2x^3 - 5x^2 - 6x + 15}{x - 3}$

28. Divide: $\frac{12x^3 - 11x^2 + 9x + 18}{4x + 3}$

29. Factor completely: $15x^3 - 60x^2y$

30. Factor completely: $m^2 + 2m + mn + 2n$

31. Factor completely: $y^2 + 9y + 20$

32. Factor completely: $12a^2 + 11a - 5$

33. Solve by factoring: $x^2 = 24 - 5x$

34. Solve by factoring: $2m^2 + 4m = 30$

35. Divide and simplify: $\frac{-6}{7t+7} \div \frac{15}{4t+4}$

36. Divide and simplify: $\frac{x^2+x-6}{x^2+4x-12} \div \frac{x+3}{x-1}$

37. Subtract and simplify: $\frac{2}{k-4} - \frac{3}{k+2}$

38. Subtract and simplify: $\frac{x}{x-2} - \frac{8}{x^2-4}$

39. Solve: $\frac{2}{p+3} - \frac{5}{4p+12} = -\frac{3}{8}$

40. Solve: $\frac{2}{x} - \frac{x}{x+3} = \frac{1}{x+3}$

41. Find h: $A = \frac{1}{2}bh; A = 32, b = 8$

42. How many liters of a 60% acid solution must be mixed with a 75% acid solution to get 20 liters of a 72% solution?

43. Simplify: -7^{-2}

44. The longer leg of a right triangle is 1 meter longer than the shorter leg. The hypotenuse is 1 meter shorter than twice the shorter leg. Find the lengths of the sides of the triangle.

45. Graph the equation: $3x - 2y = -6$

Answer Key

1. $-\frac{40}{11}$

2. $\frac{19}{14}$

3. -15

4. -68

5. $x = 4$

6. $t = -5$

7. width = 50 yards; length = 120 yards

8. lost 65 games; won 97 games

9. $t \geq -4$

10. $t < -5$

11. slope = -9

12. slope = 0

13. $y = -\frac{1}{2}x - 3$

14. $y = -\frac{3}{2}x + 2$

15. $y = -5$

16. $(0, -6)$

17. $(-3, 0)$

18. $x^{40}y^{12}$

19. $\frac{64}{x^8}$

20. $-\frac{18y^3}{x^8}$

21. 2.808×10^{10} calculations

22. 2.02×10^{14} miles

23. $-9t^2 + 9t - 8$

24. $-16m^2 + 17m - 21$

25. $9y^2 + 30y + 25$

26. $16k^2 - 56k + 49$

27. $2x^2 + x - 3 + \frac{6}{x-3}$

28. $3x^2 - 5x + 6$

29. $15x^2(x - 4y)$

30. $(m + n)(m + 2)$

31. $(y + 5)(y + 4)$

32. $(3a - 1)(4a + 5)$

33. $x = -8, 3$

34. $m = -5, 3$

35. $-\frac{8}{35}$

36. $\frac{x-1}{x+6}$

37. $\frac{-k+16}{(k+2)(k-4)}$

38. $\frac{x+4}{x+2}$

39. $p = -5$

40. $x = -2, 3$

41. $h = 8$

42. 4 liters of the 60% solution

43. $-\frac{1}{49}$

44. 3m, 4m, and 5m

45.

