

College Algebra/PreCalculus Readiness Self Test

The questions below cover the topics treated in Math 102: Intermediate Algebra. Suggested use: Solve the problems without consulting a text. If you can solve at least half the problems correctly, you will likely do OK in Math 103: College Algebra or Math 107: PreCalculus.

For problems which you do not solve correctly, the questions should at least look familiar, and you should be able to solve such problems with the aid of a text and armed with the correct answers.

1. If $y = 3 - 4x$, determine the value of y corresponding to $x = -2$.
2. Given $f(x) = \frac{7}{3x + 14}$, determine $f(2)$.
3. Graph $y = -3x + 2$.
4. Find the x - and y -intercepts of the line $5x - 3y = 15$.
5. Find the slope of the line containing the points $P_1(3, -2)$ and $P_2(5, 6)$.
6. Determine the slope of the line $5x - 3y = 15$.
7. Find an equation for the line that contains the point $(-2, 3)$ and has slope $\frac{5}{7}$.
8. Are the lines $4x - 2y = 3$ and $7x + 3y = 7$ perpendicular?
9. Graph the solution set to $2x - 3y \leq 12$.
10. Solve the system $\begin{cases} y = 2x - 4 \\ y = 3x + 8 \end{cases}$.
11. By factoring the numerator and denominator, simplify $\frac{x^2 + x - 6}{x^2 + 2x - 3}$.
12. Multiply and simplify $\frac{x^2 - x - 6}{x^2y} \cdot \frac{xy^3}{x^2 - 6x + 9}$.
13. Divide and simplify $\frac{x^2 - 4}{x^4y^3} \div \frac{x^2 + 2x - 8}{x^4y^2}$.
14. Add: $\frac{5}{x - 2} + \frac{4}{x - 2}$.
15. Subtract and simplify: $\frac{2x + 1}{x^2 + x - 6} - \frac{x - 2}{x^2 + x - 6}$.

16. Add and simplify : $\frac{2x - 1}{x^2 + 5x + 6} + \frac{5}{x + 2}$.

17. Solve: $\frac{2}{3x - 2} = 5$.

18. Solve: $\frac{2}{x + 4} = \frac{3}{x + 1}$.

19. Solve: $\frac{x + 6}{3} = \frac{2}{7}$.

20. Solve for r : $s = r + rt$.

21. Simplify: $(x^3y^9)^{\frac{4}{3}}$.

22. Simplify: $x^{-\frac{2}{3}}(x^{\frac{5}{3}} - x^{\frac{8}{3}})$.

23. Add: $\sqrt{80} - \sqrt{20}$.

24. Multiply: $(a + 2b)(a - 2b)$.

25. Multiply the complex numbers: $(2 + 4i)(3 - 2i)$.

26. Divide the complex numbers: $\frac{2 + 4i}{3 - 2i}$.

27. Solve by factoring: $3x^2 - 11x - 4 = 0$.

28. Solve by using the quadratic formula: $2x^2 + 10x + 3 = 0$.

29. Solve the inequality: $(x - 5)(x + 2) \leq 0$.

30. Graph the parabola $f(x) = x^2 + 2x - 3$.

Answers

(1) 11 (2) $\frac{7}{20}$ (3) The straight line through 2 on the y -axis and $\frac{2}{3}$ on the x -axis.

(4) x -intercept: 3, y -intercept: -5 (5) 4 (6) $5/3$

(7) Several different forms of the answer are possible. Reasonable choices are $7y = 5x + 31$, or $5x - 7y = -31$, or $y = \frac{5}{7}x + \frac{31}{7}$.

(8) No

(9) The part of the plane on and above the line through -4 on the y -axis and 6 on the x -axis.

(10) $x = -12, y = -28$ (11) $\frac{x-2}{x-1}$ (12) $\frac{y^2(x-2)}{x(x-3)}$ (13) $\frac{x+2}{y(x+4)}$ (14) $\frac{9}{x-2}$

(15) $\frac{1}{x-2}$ (16) $\frac{7}{x+3}$ (17) $x = \frac{4}{5}$ (18) $x = -10$ (19) $x = -\frac{36}{7}$

(20) $r = \frac{s}{1+t}$ (21) x^4y^{12} (22) $x - x^2$ (23) $2\sqrt{5}$ (24) $a^2 - 4b^2$ (25) $14 + 8i$

(26) $-\frac{2}{13} + \frac{16}{13}i$ (27) $x = 4, -\frac{1}{3}$ (28) $x = \frac{-5 \pm \sqrt{19}}{2}$

(29) The interval $[-2, 5]$ (30) the parabola opens upwards and its vertex is at the point $(-1, -4)$