

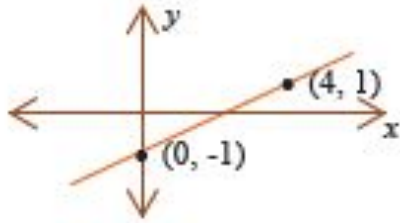
Algebra II

Diagnostic Test

Rules

- This diagnostic test consists of questions from all chapters of the course. If the student scores at least 90% in this test, then the student can skip this course. Signup for the next course.
- If the student scored less than 90% of this test, then you should join this course.
- The student should try to answer all of the questions without a calculator and without any help. No time limit and no negative scoring.
- Each question carries 1 point. Total number of answers are 23. You should score at least 21 out of 23 to score 90% or above.
- Answers are provided at end of test. Print this test if possible but keep the answer sheet away until end of test.

- 1 Factor: $5abc - 25bc + 35c$
- 2 Simplify and write in scientific notation. $\frac{(3 \times 10^{-5})(2.3 \times 10^4)}{1.2 \times 10^7}$
- 3 Amanda got a 78% on the midterm exam in English. To get a B+, the average of her midterm and final exam must be between 76% and 80%. For what range of scores on the final exam will Amanda need to get a B+?
- 4 Solve the inequalities. $|3x - 4| \leq 7$
- 5 Identify the slope of the line.


- 6 Write an equation of the line passing through the point $(2, -3)$ and perpendicular to the line $9y = -3x + 1$.
- 7 Solve the following system by substitution.

$$\begin{cases} 2x + y = 3 \\ 3x - 2y = 1 \end{cases}$$
- 8 The perimeter of a rectangle field is 140m. The length is 10m more than 4 times the width. Determine the dimension of the rectangle field.

- 9 Given $f(x) = 2x - x^2$, find $f(b + 2)$.
- 10 Factor $\frac{2}{9}u^2 - \frac{2}{25}v^2$ completely.
- 11 Simplify $\frac{\frac{1}{x} + 5}{\frac{1}{x} + x}$
- 12 It takes Tim 4 hours to clean a house and it takes 3 hours for Amanda to do the same job. How long will it take for both of them to clean the house together?
- 13 Express in simplest radical form. $\left(\frac{a^{1/4}b^{1/4}}{c^{1/12}d^{1/12}}\right)^3$
- 14 Solve $2 + \sqrt[4]{7x + 13} = 4$
- 15 How much fencing would be required for a rectangular field of area $4,000 \text{ m}^2$ if the length is 30m more than the width?
- 16 Solve $m^{-2} - 6m^{-1} - 7 = 0$.
- 17 Identify the center and radius of the following circle.
 $x^2 + y^2 - 4x + 10y + 20 = 0$
- 18 Convert $4x^2 + 25y^2 + 24x - 50y - 39 = 0$ to standard form and graph it.

19 Write as simpler logarithms $\log_4 \left(\frac{6x}{y^5} \right)$

20 Solve $\log_3 x = \log_3(4x - 1) + 2$

21 Evaluate the determinant: $\begin{vmatrix} 2 & -1 & 0 \\ 0 & 3 & -2 \\ 2 & 4 & -1 \end{vmatrix}$

22 Find the products: $\begin{bmatrix} 3 & 1 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} 2 & -3 \\ 0 & 1 \end{bmatrix}$

23 Solve a 3×3 system using matrices: $\begin{cases} 3x - 2y + 5z = 2 \\ 4x - 7y - z = 19 \\ 5x - 6y + 4z = 13 \end{cases}$

Answer Keys

1. $5c(ab - 5b + 7)$

2. 5.75×10^{-8}

3. $76 < \frac{x+78}{2} < 80, 74 < x < 82$

1. $\{x \mid -1 \leq x \leq \frac{11}{3}\}$ or $[-1, \frac{11}{3}]$

2. $m = 1/2$

3. $y = 3x - 9, L_1 \perp L_2$

4. $x=1, x = 1$

5. $w=12m, l = 58m$

6. $-b(b+2)$

7. $2\left[\left(\frac{u}{3} + \frac{v}{5}\right)\left(\frac{u}{3} - \frac{v}{5}\right)\right]$

8. $\frac{1+5x}{1+x^2}$

9. $t \approx 1.71 \text{ hr}$

10. $\sqrt[4]{\frac{a^8 b^8}{cd}}$

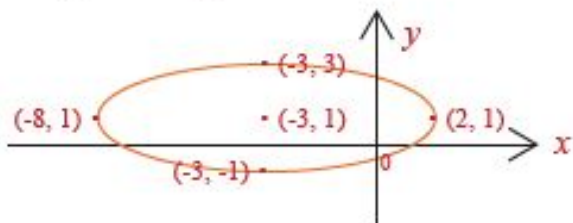
1. $3/7$

2. $W = 50m, l = 80m$

3. Let $u = m^{-1}, m = \frac{1}{7}, m = -1$

4. Center: $(2, -5),$ radius $r = 3$

5. $\frac{(x+3)^2}{5^2} + \frac{(y-1)^2}{2^2} = 1$



Answer Keys

19. $\log_4 6 + \log_4 x - 5 \log_4 y$

20. $x = \frac{9}{35} \approx 0.26$

21. 14

22. $\begin{bmatrix} 6 & -8 \\ 2 & -4 \end{bmatrix}$

23. (1, -2, -1)