

Intermediate Algebra Competency Exam (ACE)

INFORMATION & STUDY GUIDE

The Intermediate Algebra Competency Exam (ACE) is offered to students who need to fulfill the Santa Rosa Junior College math requirement for an Associate Degree. The ACE is a 29 question exam with a time limit of 2 hours 45 minutes. The test covers topics from intermediate algebra. A score of 60% or better is required to pass this exam. Non-graphing calculators are allowed and will be provided. Graphing calculators are not allowed. Test takers must present valid photo identification on the day of the exam.

Please be advised that this exam will only satisfy the mathematics competency requirement for an Associate Degree at SRJC. The ACE is not a placement test, it is not equivalent to taking a class, and the score does not transfer to other institutions. Please check the Placement Testing Schedule for dates, times and location of the ACE exam.

Students will be allowed to attempt the exam twice per term. In the event that a student does not pass the exam on the first attempt, a personalized study plan will be provided within the testing program to assist in preparation for the second attempt. That study plan will be available for 16 weeks.

In preparing for the exam, it is recommended that you review the following topics. Information and exercises may be found in most intermediate algebra textbooks.

- Function notation
- Analyzing graphs of functions
- Solving linear, quadratic, radical, rational, absolute value, exponential, and logarithmic equations
- Solving linear inequalities
- Solving equations and inequalities by graphing
- Systems of equations and inequalities
- Properties of exponents and logarithms
- Sequences and series
- Applications involving the above topics

To help you decide if you are ready to take this exam, consider the following suggestions.

- 1) Strong algebra skills are necessary to successfully complete the test.
- 2) If you believe that your algebra skills are strong enough, work through the Intermediate Algebra Competency Exam Practice Problems, which are included with this handout. The answers are given on the last page.
- 3) Students who are currently enrolled in an SRJC class may take advantage of the drop-in tutoring available at the Tutorial Center in Doyle Library at the Santa Rosa Campus or at the Tutorial Center in Doyle Hall at the Petaluma Campus.

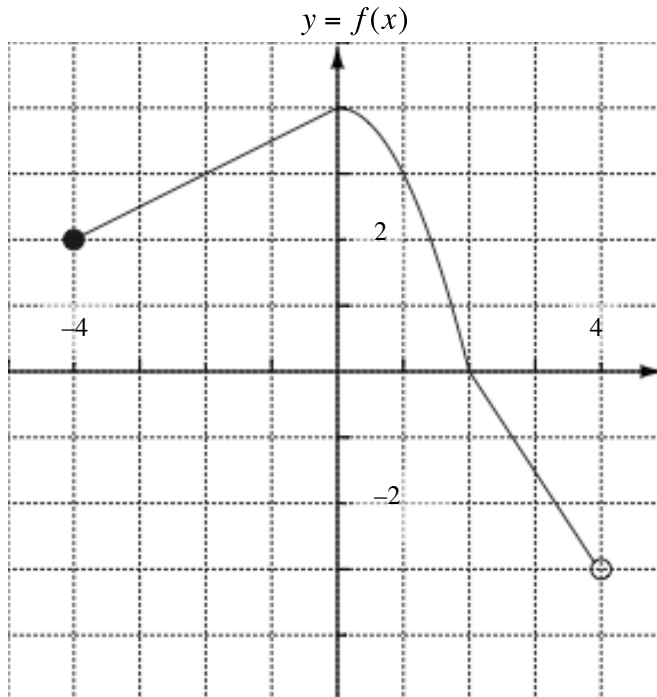
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ACE PRACTICE PROBLEMS

The format of this practice sheet is different from that of the actual Intermediate Algebra Competency Examination (ACE.) These problems are designed to target selected topics that should be reviewed before attempting the ACE. The answers to each of the problems can be found on the last page.

Use the graph of the function $f(x)$ below to answer questions #1 through #5.



1. Evaluate $f(0)$.
2. Find all values of x for which $f(x) = 3$.
3. What is the domain of $f(x)$?
4. What is the range of $f(x)$?
5. Find all solutions of the equation $f(x) = 0$.

6. For the function $g(x) = \frac{x - 5}{x^2 - 5x - 6}$,

- a) evaluate $g(7)$.
- b) for what values of x is $g(x)$ undefined?

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7. Use matrices to solve the system of equations.

$$x + y + 3z = 0$$

$$2x + y + z = 3$$

$$6x + 2y + z = 9$$

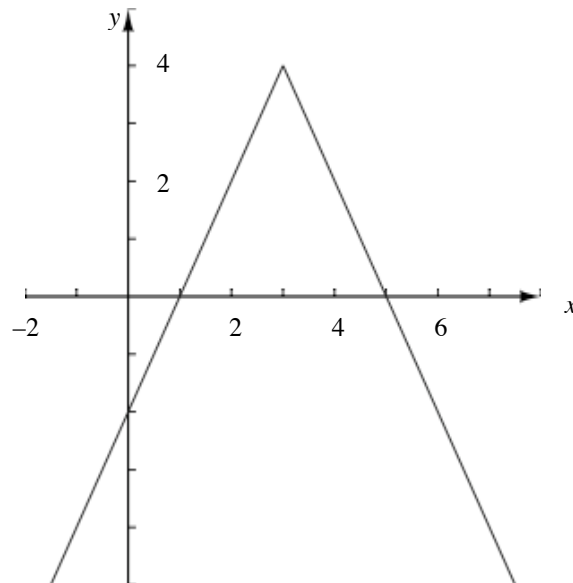
8. Solve the equation. Give exact values for solutions.

$$x^2 + 4x + 1 = 0$$

9. The graph below is the graph of :

$$f(x) = -2 \cdot |x - 3| + 4.$$

Use the graph to determine the values of x for which $-2 \cdot |x - 3| + 4 \geq 0$.



10. Solve the logarithmic equation.

$$\log_2 x = 3 - \log_2(2x - 15)$$

11. In 2009, the first cases of H1N1 Swine Flu appeared in the United States. There were 7 confirmed cases on April 23 of that year. Eight days later, on May 1, there were a total of 91 confirmed cases in the U.S. Assuming that the number of cases increases according to the exponential growth model, $P(t) = P_0 e^{kt}$, where t is measured in days since April 23, 2009, determine the value of k rounded to four decimal places.

12. Find the sum: $\sum_{k=1}^4 (k^2 - 2k)$

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ANSWERS TO ACE PRACTICE PROBLEMS

1. 4
2. $\{-2, 1\}$
3. $[-4, 4)$
4. $(-3, 4]$
5. $x = 2$
6. (a) $\frac{1}{4}$ (b) $g(x)$ is undefined at $x = 6$ and $x = -1$
7. $x = 1, y = 2, z = -1$ or $(1, 2, -1)$
8. $x = -2 \pm \sqrt{3}$
9. $[1, 5]$ or $\{x \mid 1 \leq x \leq 5\}$
10. $x = 8$
11. $k = 0.3206$
12. 10