

Practice IAD - Form B

This is a practice exam for Sacramento State's Intermediate Algebra Diagnostic Exam (IAD). The IAD exam was created to help channel students who need a review of intermediate algebra into one of the algebra review courses offered by the Sacramento State Mathematics Department.

The IAD is a 45 question exam with a 60 minute time limit that covers a variety of topics from intermediate & elementary algebra. Depending on your next math course a score of 27 or 24 is considered a passing score. If you have questions regarding what score you need to advance to your next math course, visit the Sacramento State Mathematics Department webpage at www.csus.edu/math.

This exam is intended for students to evaluate themselves in preparing for the IAD. To take this exam give yourself a quiet place to sit. Make sure you have eaten and are well rested. Time yourself for one hour. On the IAD, you may only use scratch paper and are not allowed to write in the test booklet. Do not use a calculator. After the test, grade yourself with the key that is provided in the back of this booklet. Seek help on problems that you missed and didn't understand.

Math Course	Passing Score
Math 1	NA
Math 17	24
Math 107A	24
Math 24	27
Stat 1	27
Math 26a	27
Math 29	27
Math 30	NA

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45. a b c d

1. Solve for t : $12 - 2(t - 3) \leq -8t$

- a) $\left(-\infty, \frac{5}{3}\right]$ b) $[-\infty, -3)$ c) $(-\infty, -3]$ d) $(-\infty, 15]$

2. Simplify as much as possible and write with positive exponents: $\left(\frac{3x^3y^5}{x^2y}\right)^2$

- a) $\frac{3x^6y^{10}}{x^4y^2}$ b) $3x^2y^8$ c) $\frac{9x^6y^{10}}{x^4y^2}$ d) $9x^2y^8$

3. Solve the system of equations: $\begin{cases} 8x - 2y = 2 \\ 4x - y = 1 \end{cases}$

- a) $\left(\frac{7}{3}, \frac{4}{5}\right)$ b) $(-2, 2)$ c) Infinitely many solutions d) No solution

4. Find x such that $f(x) = -11$ where $f(x) = 4x - 3$.

- a) 41 b) 2 c) -47 d) -2

5. Multiply and simplify: $(x + 2)(x + 2)(x - 2)$

- a) $x^3 - x^2 + x - 2$ b) $x^3 + 2x^2 - 4x - 8$ c) $x^3 - 8$ d) $(x + 2)(x^2 + 4)$

6. How many real solutions does this quadratic have? $x^2 - 4x + 5$

- a) 0 b) 1 c) 2 d) -1

7. Solve for x : $\frac{3}{x-2} + \frac{1}{x} = \frac{6x+4}{x^2-2x}$

a) $\frac{-3}{x^2-2x}$

b) -1

c) -3

d) 2

8. Multiply and simplify: $25x \left(\frac{x^3+4x}{5x^2} \right)$

a) $25x$

b) $5x^3+20x$

c) $5x^2+20$

d) $5x^2+4x$

9. Simplify: $-\sqrt[3]{-125x^6}$

a) $-5x^2$

b) $5x^2$

c) $25x^3$

d) $-25x^2$

10. Which of the following is a solution for $\left| \frac{1}{2}x - 1 \right| = 5$?

a) 0

b) 10

c) -8

d) -12

11. Simplify and express with positive exponents: $\frac{(x^3)^{-2}(-x^{-2})^3}{x^{-10}}$

a) x^{46}

b) $\frac{x^{10}}{x^{12}}$

c) $-x^{26}$

d) $\frac{-1}{x^2}$

12. Find the midpoint of the line segment between $(5, -2)$ and $(-1, 0)$.

a) $(2, -1)$

b) $(4, -2)$

c) $-\frac{1}{3}$

d) -3

13. Find the quotient and express the answer in scientific notation: $\frac{0.36 \times 10^5}{3.0 \times 10^2}$

- a) 12.0×10^{-3} b) 0.12×10^3 c) 1.2×10^2 d) 1.2×10^{-2}

14. Add these polynomials: $(3x - 5) + (x^2 - 2) - (-5x + 1)$

- a) $3x^3 - 8$ b) $x^2 - 2x - 6$ c) $x^2 + 8x - 8$ d) $-x - 8$

15. Which best describes the graph of this function? $4 + 2x - 3x^2$

- a) Opens up b) Opens down c) Is a vertical line d) Is a horizontal line

16. Solve the following equation for t : $\frac{3}{t} + \frac{2}{m} = 2$

- a) $\frac{2m - 2}{3}$ b) $2m - \frac{2}{3}$ c) $\frac{3m}{2m - 2}$ d) Undefined

17. Subtract and simplify: $\frac{m}{4 - m} - \frac{m + 2}{m - 4}$

- a) 2 b) $\frac{2}{4 - m}$ c) $\frac{m + 1}{2 - m}$ d) $\frac{2m + 2}{4 - m}$

18. Simplify and write with positive exponents: $(ab^{-\frac{7}{5}})^{-\frac{5}{7}}$

- a) $a^{\frac{5}{7}}b$ b) ab c) $\frac{1}{a^{5/7}b^{12/35}}$ d) $\frac{b}{a^{\frac{5}{7}}}$

19. Consider $2x - 5 < 12$, where x is a positive whole number. Which of the following is the largest possible value for x ?

- a) 9 b) 7 c) 8.5 d) 3.5

20. Simplify and write with positive exponents: $\frac{15a^5b^{-4}}{21a^{-2}b^5}$

- a) $\frac{3a^3}{7b}$ b) $\frac{15a^3}{21b^9}$ c) $\frac{5a^7}{7b^9}$ d) $\frac{3}{5a^{10}b^{20}}$

21. If the slope of a line is 5 and the line passes through the point $(4, -5)$, what is the equation of the line?

- a) $y = -5x - 15$ b) $y = 5x - 5$ c) $y = 4x - 5$ d) $y = 5x - 25$

22. Simplify: $\frac{\frac{1}{2} + \frac{1}{3}}{\frac{1}{4} + \frac{1}{5}}$

- a) $\frac{15}{20}$ b) $\frac{50}{27}$ c) $\frac{3}{4}$ d) 4

23. Evaluate $-x^3 + 2x^2 - 3x + 5$ when $x = -2$.

- a) 27 b) 11 c) -17 d) 13

24. A root of $5x^2 + 6x - 9$ is...

- a) $\frac{3 + \sqrt{6}}{5}$ b) $\frac{-3 - 3\sqrt{6}}{5}$ c) $\frac{6 - \sqrt{6}}{10}$ d) $\frac{3 + 6\sqrt{6}}{5}$

25. Solve for x : $3^{-1} + 3^{-2} = x^{-1}$

a) $\frac{4}{9}$

b) $\frac{9}{4}$

c) $-\frac{4}{9}$

d) 3

26. Add and simplify: $x^{-1} + x^{-2}$

a) $\frac{1}{x^3}$

b) $\frac{x+1}{x^2}$

c) $\frac{3}{x}$

d) $\frac{1}{x+x^2}$

27. Determine the solution: $\sqrt{4x-7} + 3 = 10$

a) 24.5

b) 44

c) 14

d) -3

28. Expand as much as possible using the properties of logarithms: $\log\left(\left(\frac{R}{4}\right)^3\right)$

a) $3(\log(R) + \log(4))$

b) $3\log R - 3\log 4$

c) $3\log R + \log 4$

d) $\frac{\log R^3}{4^3}$

29. Simplify as much as possible: $\left(\frac{xyz}{z^2y}\right)^0$

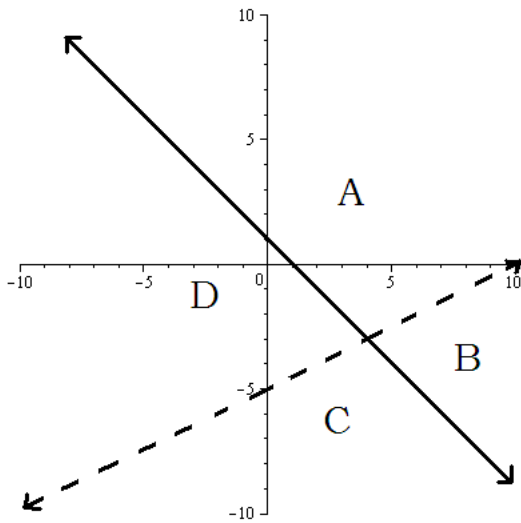
a) $\left(\frac{z}{x^3y^2}\right)$

b) 0

c) $\left(\frac{z}{x}\right)$

d) 1

30. Which of the following regions is the solution to the following system of inequalities? $\begin{cases} y < \frac{1}{2}x - 5 \\ y \geq -x + 1 \end{cases}$



- a) *A* b) *B* c) *C* d) *D*

31. Consider the function, $f(x) = x^2 + 2x$. Find $f(m - 1)$.

- a) 3 b) $m^2 - 1$ c) $m^2 + 2m + 1$ d) $m^2 + 2m$

32. Factor completely: $6x^2 - 4xy - 3xy + 2y^2$

- a) $6x^2 - 7xy + 2y^2$ b) $(2x - y)(3x + 2y)$ c) $(2x - y)(3x - 2y)$ d) $(2x + y)(3x - 2y)$

33. Simplify: i^{579}

- a) -1 b) *i* c) -*i* d) 1

34. What are the values of x that will make this expression undefined? $\frac{x^2 - 4}{x^2 - 2x}$

- a) None b) 2 and -2 c) $\frac{x+2}{x}$ d) 0 and 2

35. Simplify: $\frac{\left(\frac{2}{x} - 2\right)}{\left(\frac{4}{x} + 4\right)}$

- a) $\frac{1-x}{2+2x}$ b) $\frac{-1}{2}$ c) $\frac{2+2x}{4-2x}$ d) $\frac{4(1-x)(2+x)}{x^2}$

36. Simplify and write with rational exponents: $\sqrt{\sqrt[3]{x^4}}$

- a) $x^{2/3}$ b) x^{12} c) $x^{1/12}$ d) $x^{4/5}$

37. Solve for x : $\log_2 12 + \log_2(x - 3) = 3$

- a) $x = -1$ b) $x = \frac{11}{3}$ c) $x = \frac{5}{12}$ d) $x = -\frac{7}{3}$

38. Simplify with positive exponents: $\frac{(-5a^3b)^4}{-5^3a^{-3}b^6}$

- a) $\frac{a^{12}}{5^2b^2}$ b) $\frac{-5a^9}{b^2}$ c) $\frac{a^{15}}{5^2b^2}$ d) $\frac{-5a^{15}}{b^2}$

39. Consider the linear equation, $y = -3x - 7$. What is the x -intercept?

- a) $(-7, 0)$ b) $\left(\frac{3}{7}, 0\right)$ c) $\left(-\frac{7}{3}, 0\right)$ d) $(7, 0)$

40. Find the product and write your answer in scientific notation: $(3.7 \times 10^8)(7.0 \times 10^{-4})$

- a) 2.59×10^{-3} b) 2.59×10^{12} c) 2.59×10^5 d) 25.9×10^4

41. Factor completely: $2x^3y - 6x^2y + 4xy$

- a) $2(x^2y - xy)(x + 2)$ b) $2xy(x^2y - 3x + 4)$ c) $xy(x + 1)(x - 2)$ d) $2xy(x - 1)(x - 2)$

42. Simplify: $\frac{3 + 7i}{11 - i}$

- a) $\frac{1}{3} + 7i$ b) $\frac{1}{3} + \frac{2}{3}i$ c) $\frac{10}{11}i$ d) $\frac{13}{61} + \frac{40}{61}i$

43. Solve for m : $\frac{2}{m} - 3a = x$

- a) $\frac{3a + x}{2}$ b) $\frac{x - 3a}{2}$ c) $\frac{2}{3a + x}$ d) $\frac{-a}{x}$

44. Divide and simplify: $\frac{16 - x^2}{x^2 - 25} \div \frac{x + 4}{x - 5}$

- a) $\frac{4 - x}{x + 5}$ b) $\frac{x - 4}{x + 5}$ c) $\frac{-4}{5}$ d) $\frac{-x - 4}{x - 5}$

45. Rationalize the denominator: $\frac{7}{\sqrt{5} + \sqrt{3}}$

- a) $\frac{7}{2}$ b) $\frac{7\sqrt{5} + 7\sqrt{3}}{8}$ c) $\frac{7\sqrt{5}}{16} - \frac{7\sqrt{3}}{16}$ d) $\frac{7\sqrt{5}}{2} - \frac{7\sqrt{3}}{2}$

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