Practice IAD - Form C

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

Date: Spring 2010

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1. Simplify and express with positive exponents: $\dfrac{5^{-2}x^6y^{10}}{2^{-5}x^{10}y^6}$

   a) $\dfrac{25x^4}{32y^4}$ b) $\dfrac{32y^4}{25x^4}$ c) $\dfrac{32x^4}{25y^4}$ d) $\dfrac{25}{32x^4y^4}$

2. Multiply and write with rational exponents: $y^{\frac{1}{2}}(y^{\frac{1}{2}} - y^{\frac{-1}{2}})$

   a) $y - 1$ b) $y^{1/4} - y^{-1/4}$ c) 0 d) y

3. Subtract and simplify: $\dfrac{4x+3}{2x} - \dfrac{1}{2x}$

   a) $\dfrac{4x+2}{0}$ b) $\dfrac{4x+3}{4x}$ c) $\dfrac{2x+2}{x}$ d) $\dfrac{2x+1}{x}$

4. Solve the system of equations: $\begin{cases} 2x + 5y = -2 \\ y = -\dfrac{x}{2} \end{cases}$

   a) $(4, -2)$ b) $\left(-\dfrac{1}{2}, \dfrac{5}{2}\right)$ c) No solution d) Infinitely many solutions

5. Multiply and simplify: $(4x + \frac{1}{3})(9x + \frac{1}{2})$

   a) $36x^2 + 5x + \dfrac{1}{6}$ b) $36x^2 + 5x - \dfrac{1}{6}$ c) $36x^2 - \dfrac{1}{6}$ d) $36x^2 - x - \dfrac{1}{6}$

6. How many real roots does this quadratic have? $2x^2 - 2x + 1$

   a) One b) Two c) Infinitely many solutions d) None

7. Multiply and express the answer in scientific notation: $(5.5 \times 10^{-10})(2.0 \times 10^{8})$

a) 1.1×10^{-1} b) 11.0×10^{-2} c) 1.1×10^{-3} d) 11.0×10^{2}

8. Harry has test grades of 85, 87, and 77 on his first three algebra tests. What must he get on his fourth test to earn an average of at least 84?

a) $x \geq 84$ b) $x \leq 87$ c) $x \leq 84$ d) $x \geq 87$

9. Determine the values of x for which $\dfrac{x-5}{3x+6}$ is undefined.

a) $5, -2$ b) 5 c) -2 d) $2, -5$

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

a) $\dfrac{x^{12}}{x^{10}}$ b) $\dfrac{-1}{x^{26}}$ c) $-x^2$ d) $\dfrac{1}{x^{46}}$

11. Rationalize the denominator: $\dfrac{-1}{\sqrt{x}-1}$

a) $\dfrac{1-\sqrt{x}}{x+1}$ b) $\dfrac{-1}{x-1}$ c) $\dfrac{\sqrt{x}+1}{x+1}$ d) $\dfrac{\sqrt{x}+1}{1-x}$

12. Simplify: $\dfrac{1}{\left(\dfrac{1}{x}+\dfrac{1}{w}\right)}$

a) $x+w$ b) $\dfrac{xw}{x+w}$ c) $\dfrac{x+w}{xw}$ d) $\dfrac{1}{x+w}$

13. Find an equation of a line that passes through the points $(-1, 2)$ and $(5, 0)$.

a) $y = \frac{1}{2}x + 5$ b) $y = \frac{-1}{3}x + 2$ c) $y = -\frac{1}{3}x + \frac{5}{3}$ d) $y = \frac{1}{2}x - \frac{5}{3}$

14. Factor: $4a^2b^4 - 9d^6$

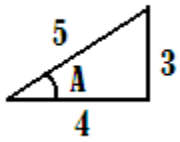
a) $(2a^2b^2 - 3d^2)(2a^2b^2 + 3d^2)$ b) $(2ab^2 - 3d^3)(2ab^2 + 3d^3)$

c) $(4ab - 9d^5)(ab + d)$ d) $(2ab - 3d)(2ab + 3d)$

15. Solve for x: $x^2 + 4x + 2 = 0$

a) $-2 \pm i\sqrt{2}$ b) $2 \pm \sqrt{2}$ c) $-2 \pm \sqrt{2}$ d) $2 \pm i\sqrt{2}$

16. What is $\sin(A)$ in this right trangle?



a) $\frac{4}{5}$ b) $\frac{3}{5}$ c) $\frac{3}{4}$ d) $\frac{5}{4}$

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

a) 0 b) 10 c) -8 d) -12

18. Solve for x: $\dfrac{6}{x} + \dfrac{8}{9} = \dfrac{10}{3x}$

a) -3 b) 3 c) -3 and 3 d) No Solution

19. Simplify: $(3^2x^3y^5)^4$

a) $3^6x^7y^9$ b) $3^8x^{12}y^{20}$ c) $3^2x^{12}y^{20}$ d) $3^8x^7y^9$

20. Solve for x: $\sqrt{-x+1} + 1 = x$

a) $x = 0, 1$ b) $x = 0$ c) $x = 1$ d) Imaginary Solutions

21. Divide and simplify: $\dfrac{x^2+2x-35}{x^2+4x-21} \div \dfrac{x-5}{x^2+3x-18}$

a) $x+7$ b) $x+6$ c) $x-3$ d) $x-6$

22. A line has a slope of $m = -\dfrac{1}{3}$ and passes through points $(-4, k)$ and $(2, 3)$. Fine the value of k.

a) 5 b) $\dfrac{7}{3}$ c) -5 d) $\dfrac{11}{3}$

23. Evaluate $-y^4 + y^3 + y^2 + y + 1$ for $y = -1$.

a) 1 b) 5 c) -1 d) 3

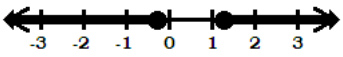
24. Simplify: i^{401}

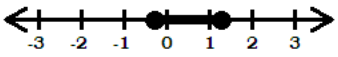
a) $-i$ b) -2 c) i d) 1

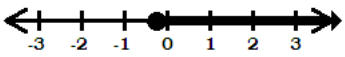
25. Consider the function, $f(x) = 3x^2 - 4$. For what value(s) of x is $f(x) = 23$?

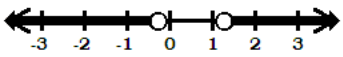
a) $x = -3$ b) $x = -3, 3$ c) $x = 3$ d) None

26. Graph the solution to this absolute value inequality: $|6x - 3| - 5 \geq 0$

a) 

b) 

c) 

d) 

27. Solve for a: $a^{-1} + b^{-1} = 1$

a) $\frac{1}{b}$ b) b c) $\frac{1}{b-1}$ d) $\frac{b}{b-1}$

28. Simplify and express the answer with positive exponents: $\frac{(-3^2)^3}{(-3)^{-4}}$

a) -3^{10} b) 3^2 c) 3^9 d) 3^{10}

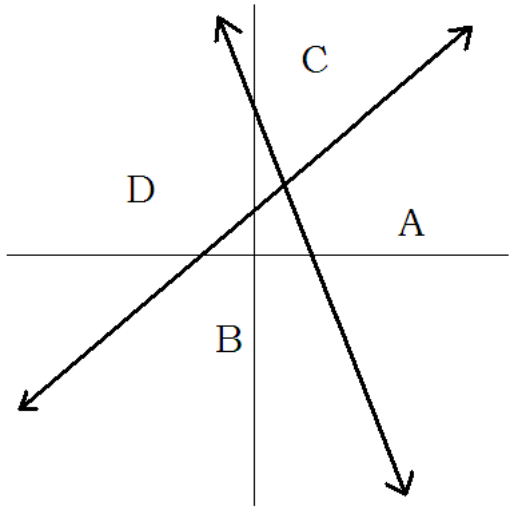
29. Evaluate and simplify: $\sqrt{64+36}$

a) 14 b) 10 c) $3\sqrt{10}$ d) $2\sqrt{7}$

30. Find the sum of $a^{-1}+b^{-1}$.

a) $\dfrac{b+a}{ab}$ b) $(ab)^{-1}$ c) $\dfrac{1}{a+b}$ d) $-a-b$

31. Indentify the solution area for the following system of inequalities: $\begin{cases} 2x-y \geq -3 \\ 4x+y \leq 5 \end{cases}$



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

32. Add and simplify by combining like terms: $(5x+2)-(3x+1)+(2-x)$

a) $30x^2+2x$ b) $x+5$ c) $7x+3$ d) $x+3$

33. Write $\dfrac{4-3i}{4+3i}$ in $a+bi$ form.

a) $1-i$ b) $\dfrac{16}{7}-\dfrac{9}{7}i$ c) $5i$ d) $\dfrac{7}{25}-\dfrac{24}{25}i$

34. A right triangle has a hypotenuse of length 10 and one leg has length 5. Find the exact length of the other leg.

a) $5\sqrt{2}$ b) 75 c) 5 d) $5\sqrt{3}$

35. For what values of x is this true: $(x+3)(x-2) \geq 0$

a) $x \leq -3$ or $x \geq 2$ b) $x \leq -2$ or $x \geq 3$ c) $-3 \leq x \leq 2$ d) $-2 \leq x \leq 3$

36. Solve for x: $\dfrac{5}{x}+y=5M$

a) $x=\dfrac{5+y}{5M}$ b) $x=5M-\dfrac{5}{y}$ c) $x=\dfrac{1}{M-y}$ d) $x=\dfrac{5}{5M-y}$

37. Simplify: $\left(\dfrac{(5x^2)^3y^4}{x^7}\right)^3$

a) $\dfrac{5y^{12}}{x^3}$ b) $\dfrac{5^3y^{12}}{x^{15}}$ c) $\dfrac{5^6y^7}{x^5}$ d) $\dfrac{5^9y^{12}}{x^3}$

38. Multiply: $2\sqrt{10}(3\sqrt{5}-2\sqrt{2})$

a) $3\sqrt{2}-2\sqrt{5}$ b) $2\sqrt{30}$ c) $30\sqrt{2}-8\sqrt{5}$ d) 0

39. Simplify: $\dfrac{6x^2 - 7x - 5}{2x^2 + 5x + 2}$

a) $\dfrac{3x+5}{x-2}$ b) $\dfrac{3x+5}{x+2}$ c) $\dfrac{3x-5}{x-2}$ d) $\dfrac{3x-5}{x+2}$

40. What is the y-intercept of the line $10x - 15y = -12$?

a) $\left(0, \dfrac{4}{5}\right)$ b) $(0, -12)$ c) $\left(0, \dfrac{-6}{5}\right)$ d) $(0, 10)$

41. Factor: $25 - 16x^2y^2$

a) $(5 + 4xy)(5 + 4xy)$ b) $(5 - 4xy)(5 + 4xy)$ c) $(5 - 4xy)^2$ d) $(4xy - 5)(4xy + 5)$

42. Determine the value(s) of k for which there is one and only one real solution to the following quadratic: $10kx = -16x^2 - 25$.

a) $k = \pm 4$ b) $k = 4$ c) $k = 2$ d) $k = -4$

43. If $f(x) = -x^4 + x^3 + x^2 + x + 1$, find $f(-1)$.

a) 1 b) 5 c) -1 d) 3

44. Write in Exponential form: $\log_{17} 4913 = 3$

a) $4913 = 3^{17}$ b) $17 = 4913^3$ c) $10^{17} = 4913^3$ d) $17^3 = 4913$

45. Solve for x: $\dfrac{2x^2 + x - 3}{x - 1} = 5$

a) $x = 1, 6$ b) $x = 1$ c) All Real Answers d) No Solution

1. a **b** c d
2. **a** b c d
3. a b c **d**
4. **a** b c d
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