



# Los Medanos College

## Practice Intermediate Algebra Challenge Exam

*Please Read Carefully*

The attached algebra problems cover some of the topics you may wish to review before attempting the LMC Intermediate Algebra (Math 30) Challenge Exam

Passing of the challenge exam allows you to take any course that says “Prerequisite: Math 30 or Equivalent.” You do not receive units or a grade for passing the exam.

### **Exam Information**

**When/Where:** The exam is scheduled individually in MA 107. Please contact the Math Lab Coordinator at (925) 439-2181 ext 3470 (8am –5pm) or ext 3358 (5pm – 9pm) in order to make an appointment.

**Appointment Date and Time:** \_\_\_\_\_

**Passing Scores:** You will need to answer 20 or more problems out of 45 correctly to qualify for enrollment into a statistics course.

You will need to answer 23 or more problems out of 45 correctly to qualify for enrollment into a pre-calculus course or any course beyond statistics.

**Preparation:** Study attached sample problems. Review as needed. Review material may be found in any current textbooks, many of which have titles “Intermediate Algebra.” The questions provided in this packet are from:

Title:	Intermediate Algebra, 5 <sup>TH</sup> edition
Authors:	Bittinger, Keedy, and Ellenbogen
Publisher:	Addison Wesley

**You may use:** Pencil, and eraser. Scratch paper will be provided. **NO CALCULATOR ALLOWED.**

**Identification:** Photo ID required - Drivers License/CA ID or a Passport.

**Results:** Usually available within 1 week.

**Repeat Attempts:** Exam may be taken a total of 2 times.

Solutions

1) C 2) D 3) E;  $x = -\frac{5}{2}$  4) B 5) D 6) A 7) A 8) D 9) B 10) A 11) C 12) C  
13) D 14) E;  $x = -\frac{1}{2}, 2$  15) C 16) A 17) C 18) A 19) E 20) B 21) B 22) A 23) D;  
24) A 25) E 26) B 27) A 28) D 29) B 30) C 31) A 32) C 33) D

1. Change  $\frac{7}{16}$  to percent notation.

- A. 0.4375%    B. 4.375%    C. 43.75%    D. 437.5%    E. None of these

2.  $\left(\frac{2}{5} + \frac{1}{4}\right) \div \frac{1}{5} =$

- A.  $\frac{5}{3}$     B.  $\frac{3}{4}$     C.  $\frac{1}{15}$     D.  $\frac{13}{4}$     E. None of these

3. The slope of a line passing through the two points (1, 3) and (3, -2) is

- A.  $\frac{1}{4}$     B.  $\frac{1}{2}$     C.  $-\frac{2}{5}$     D. -2    E. None of these

4.  $\left(\frac{1}{2}x - 5\right)^2 =$

- A.  $\frac{1}{4}x^2 + 5x - 25$     B.  $\frac{1}{4}x^2 - 5x + 25$     C.  $\frac{1}{4}x^2 - \frac{5}{2}x - 25$     D.  $\frac{1}{4}x^2 - \frac{5}{2}x + 25$     E. None of these

5. The slope of a line perpendicular to the line with the equation  $3x - 5y + 4 = 0$  is

- A.  $-\frac{3}{5}$     B.  $\frac{3}{5}$     C.  $\frac{5}{3}$     D.  $-\frac{5}{3}$     E. None of these

6. Solve the inequality  $3x - 7 > 5x + 6$ .

- A.  $x < -\frac{13}{2}$     B.  $x > -\frac{13}{2}$     C.  $x < -\frac{1}{2}$     D.  $x > -\frac{1}{2}$     E. None of these

7. If  $y$  varies inversely as  $x$ , and  $y = 18$  when  $x = 6$ , find  $x$  when  $y = 2$ .

- A. 54    B.  $\frac{1}{54}$     C.  $\frac{2}{3}$     D.  $\frac{3}{2}$     E. None of these

8. Simplify  $\left(\frac{a^2b^{-3}}{a^{-3}b^2}\right)^{-2}$

- A.  $\frac{b}{a}$     B.  $\left(\frac{a}{b}\right)^2$     C.  $\left(\frac{a}{b}\right)^6$     D.  $\left(\frac{b}{a}\right)^{10}$     E. None of these

9. Divide and simplify  $\frac{x^2 - 2x + 1}{x^2 - 1} \div \frac{x^2 - 3x + 2}{x - 2}$

A.  $\frac{(x-1)^2}{x+1}$     B.  $\frac{1}{x+1}$     C.  $\frac{x-2}{(x+1)(x+2)}$     D. 1    E. None of these

10. Which of the following is a factor of  $x^3 + x^2 - ax^2 - ax$ ?

- A.  $x - a$     B.  $x - 1$     C.  $x^2$     D.  $ax$     E. None of these

11. Combine terms and simplify:  $12\sqrt{45} - 8\sqrt{80}$ .

- A.  $-20\sqrt{5}$     B.  $-4\sqrt{35}$     C.  $4\sqrt{5}$     D.  $8\sqrt{5}$     E. None of these

12. Solve  $A = \frac{1}{2}h(a + b)$  for h.

- A.  $h = \frac{a+b}{2a}$     B.  $h = \frac{a}{2(a+b)}$     C.  $h = \frac{2a}{a+b}$     D.  $h = \frac{2(a+b)}{a}$     E. None of these

13. Solve the system of equations for x:  $3x + y = -1$ ,  $x + 2y = 3$ .

- A.  $x = -2$     B.  $x = 2$     C.  $x = 1$     D.  $x = -1$     E. None of these

14. Solve for x:  $2x^2 - 3x = 2$ .

- A.  $-\frac{1}{2}, -2$     B.  $-\frac{3}{2}, 2$     C.  $\frac{3}{2}, 2$     D.  $\frac{1}{2}, -2$     E. None of these

15. Solve for x:  $\frac{1}{x-4} - \frac{1}{x-2} = \frac{1}{4}$

- A.  $x = 4, x = 2$     B.  $x = 0, x = 2$     C.  $x = 0, x = 6$     D.  $x = 6, x = 4$     E. None of these

16. Simplify  $\frac{\sqrt[5]{(a+b)^3}}{\sqrt{(a+b)}}$  (Assume a and b are positive.)

- A.  $(a+b)^{1/10}$     B.  $(a+b)^{2/5}$     C.  $(a+b)$     D.  $(a+b)^{-2/5}$     E.  $(a+b)^{-1}$

17. Rationalize the denominator:  $\frac{2}{2\sqrt{5} - \sqrt{3}}$

- A.  $\frac{4}{17}\sqrt{5} + \frac{1}{17}\sqrt{3}$     B.  $\frac{4}{21}\sqrt{5} + \frac{2}{21}\sqrt{3}$     C.  $\frac{4}{17}\sqrt{5} + \frac{2}{17}\sqrt{3}$     D.  $\frac{4}{21}\sqrt{5} - \frac{2}{21}\sqrt{3}$     E. None of these

18. If  $\frac{5y^3 + 3y^2 + 3y + 5}{5y - 2} = p(y) + \frac{a}{5y - 2}$ , find p(y) and a. hint: p(y) is the quotient and a is the remainder.

- A.  $p(y) = y^2 + y + 1, a = 7$     B.  $p(y) = y^2 + y + 1, a = 1$     C.  $p(y) = y^2 + y - 1, a = 3$   
 D.  $p(y) = y^2 + y - 1, a = -1$     E. None of these

19. One solution of  $2x^2 + 2x - 1 = 0$  is

- A.  $-1 - \sqrt{3}$       B.  $-2 - \frac{1}{2}\sqrt{3}$       C.  $-2 - \sqrt{3}$       D.  $\frac{1}{2} - \frac{1}{2}\sqrt{3}$       E.  $-\frac{1}{2} - \frac{1}{2}\sqrt{3}$

20. Express in terms of  $\log(x)$ ,  $\log(y)$  and  $\log(z)$ :  $\log \sqrt{\frac{z^3}{xy}}$ .

- A.  $\left(\frac{3\log z}{(\log x)(\log y)}\right)^{1/2}$       B.  $\frac{3}{2}\log z - \frac{1}{2}\log x - \frac{1}{2}\log y$       C.  $(3\log z - \log x - \log y)^{1/2}$

- D.  $\frac{1}{2}\left(\frac{3\log z}{(\log x)(\log y)}\right)$       E.  $\frac{3}{2}\log z - \frac{3}{2}\log x + \frac{1}{2}\log y$

21.  $\left(\frac{1}{8}\right)^{-2/3} =$

- A.  $\frac{1}{4}$       B. 4      C.  $16\sqrt{2}$       D.  $\frac{1}{16\sqrt{2}}$       E. None of these

22. Express as a single logarithm and simplify:  $\log_a 7 - \log_a 20 + 2 \log_a 4$ .

- A.  $\log_a \left(\frac{28}{5}\right)$       B.  $\log_a 3$       C.  $\log_a \left(\frac{7}{10}\right)$       D.  $\log_a 6$       E. None of these

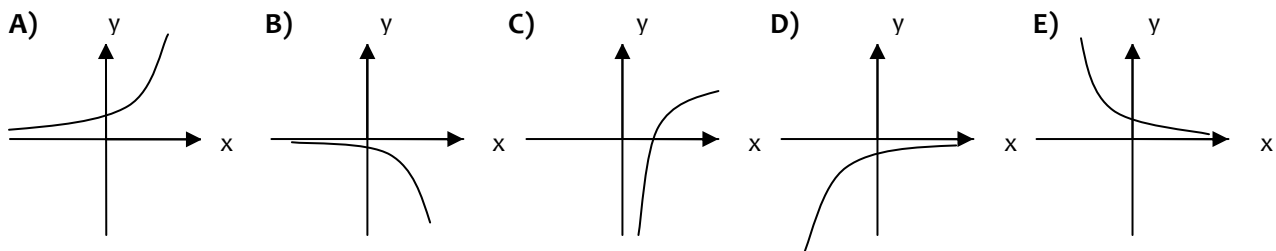
23.  $\log_2 \left(\frac{1}{16}\right) =$

- A.  $\frac{1}{4}$       B.  $-\frac{1}{4}$       C. 4      D. -4      E. None of these

24. What is the y-intercept of the graph  $y = \log_3(x+1)$ ?

- A. 0      B. 3      C.  $\frac{1}{3}$       D. 1      E. None of these

25. Which of the following looks most like the graph of  $y = 2^{-x}$ ?



26. Solve for x:  $\log_3 x = 2$ .

- A.  $x = 6$       B.  $x = 9$       C.  $x = 8$       D.  $x = 2$       E. None of these

27. The sum of two positive numbers is  $\frac{3}{2}$  and their difference is  $\frac{1}{2}$ . Find the smaller of the two numbers

- A.  $\frac{1}{2}$       B.  $\frac{3}{2}$       C. 1      D.  $\frac{1}{4}$       E. None of these

28. Bob is 25 years older than his daughter Jane. Three years ago, Bob was twice as old as Jane. What is Jane's present age?

- A. 26      B. 27      C. 22      D. 28      E. 25

29. Paul can paint a room in 5 hours. Sally can paint the same room in 3 hours. How long will it take for them to paint the room if they work together?

- A. 4 hours      B.  $1\frac{7}{8}$  hours      C. 3 hours      D.  $\frac{8}{15}$  hours      E. None of these

30. The base of a triangle is 5 inches less than its altitude. The area is 18 square inches. Find the base of the triangle.

- A. 9 inches      B. 6 inches      C. 4 inches      D. 34 inches      E. None of these

31. At 2:00 P.M. two cars start toward each other from towns 240 miles apart. If the rate of one car is 10 mph faster than the other, find the rate of the faster car if the two cars meet at 5:00 P.M.

- A. 45 mph      B. 35 mph      C. 40 mph      D. 30 mph      E. None of these

32. A stereo dealer marks up all his merchandise 55% over his cost. If he sells a radio for \$30.00, how much did he pay for it?

- A. \$16.50      B. \$24.55      C. \$19.35      D. \$13.50      E. \$20.69

33. Two investments are made totaling \$4800. Part of the money is invested at 8% and the rest at 9%. In the first year they yield \$412 in simple interest. How much money is invested at 8%?

- A. \$1820      B. \$2980      C. \$2600      D. \$2000      E. None of these