

College Level Practice Test for Accuplacer**A. Algebraic operations**

1. Where defined, $\frac{x^2 - 49}{x+1} \div \frac{7-x}{x}$ reduces to

a) $\frac{(x^2 - 49)(7-x)}{(x+1)x}$ b) $\frac{-x(x+7)}{x+1}$ c) $\frac{-x(x-7)}{x+1}$ d) $\frac{7(x^2 - 49)}{x+1}$

2. Where defined, $\frac{2a^2 - 2}{4a^2 + 16a + 12}$ reduces to

a) $\frac{1}{16a-4}$ b) $\frac{1}{4a+2}$ c) $\frac{a-1}{2(a+3)}$ d) $\frac{a+1}{2a+6}$

3. Factor $4x^2 + 8x - 12$ completely.

a) $(4x+1)(x-12)$ b) $[2(x-4)]^2$ c) $4(x-1)(x+3)$ d) $4(x-3)(x+1)$

4. Expand $(-x)(x-4)(2x+1)$.

a) $2x^3 - 7x^2 + 4x$ b) $-2x^3 + 7x^2 + 4x$ c) $2x^3 + 7x^2 - 4x$ d) $-2x^3 - 7x^2 - 4x$

5. Give the exponential representation of the radical expression $\frac{1}{\sqrt{x^5}}$.

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

6. Evaluate $\left(\frac{25}{64}\right)^{3/2}$.

a) $\frac{75}{128}$ b) $\frac{25}{36}$ c) $\frac{125}{512}$ d) $\frac{8}{5}$

7. Simplify $x^{3/2}x^{-2}$ and eliminate any negative exponents. Assume all letters denote positive numbers.

a) x^3

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

c) $\frac{1}{\sqrt{x}}$

d) \sqrt{x}

B. Solutions of equations and inequalities

8. For what real numbers x is $x^2 - x - 12 = 0$?

a) 4 and -3

b) -4 and 3

c) -4 and -3

d) 4 and 3

9. For what real numbers x is $3x^2 + 5x - 2$ positive?

a) $\left(-2, \frac{1}{3}\right)$

b) $(-\infty, -2)$ and $\left(\frac{1}{3}, \infty\right)$

c) $(-\infty, -2)$

d) $\left(-\infty, \frac{1}{3}\right)$ and $(-2, \infty)$

10. Solve for m : $-\frac{2}{3}(m-3) < \frac{1}{2}(5-m)$

a) $m > 3$

b) $m < -3$

c) $m > -3$

d) $m < 3$

11. Solve for x : $(x+2)^2 = 8$. Be sure the value of x is in simplified radical form.

a) $x = 2 \pm 2\sqrt{2}$

b) $x = \pm\sqrt{6}$

c) $x = 2 \pm \sqrt{8}$

d) $x = -2 \pm 2\sqrt{2}$

12. A root of $x^2 - 7x + 3 = 0$ is

a) $\frac{-7 + \sqrt{61}}{2}$

b) $7 + \sqrt{37}$

c) $\frac{-7 + \sqrt{37}}{2}$

d) $\frac{7 + \sqrt{37}}{2}$

13. If $3x^2 - 4x + 7 = 0$, then $\left(x - \frac{2}{3}\right)^2 =$

- a) $\frac{17}{9}$ b) $-\frac{17}{9}$ c) $\frac{5}{9}$ d) $-\frac{5}{9}$

C. Coordinate geometry

14. If $M(-2,3)$ is the midpoint of segment PQ and the coordinates of P are $(-8,5)$, find the coordinates of Q .

- a) $(4,1)$ b) $(-10,8)$ c) $(-1,-4)$ d) $(-5,4)$

15. The graph of $f(x) = (x-5)^3$ is the same as the graph of $f(x) = x^3$ except that it is shifted

- a) five units down b) five units up c) five units to the left d) five units to the right

16. What quadrant is the vertex of $f(x) = -3(x-2)^2 + 6$ in?

- a) I b) II c) III d) IV

17. Does $y = 4x + 3$ cross the x -axis, y -axis, neither, or both?

- a) x -axis b) y -axis c) neither d) both

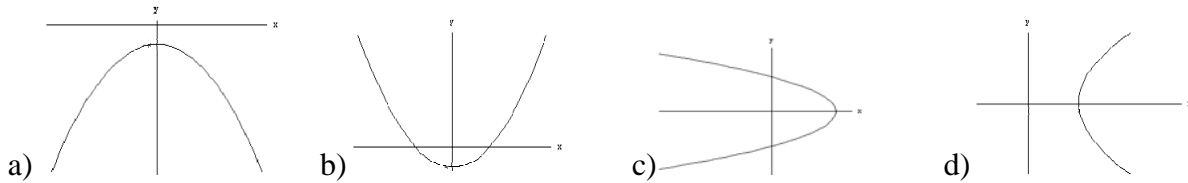
18. An equation of the line that contains the origin and the point $(-2,3)$ is

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

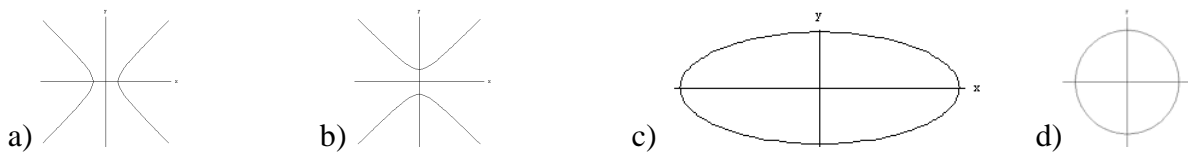
19. Decide if the lines $2x + 5y = -6$ and $5x - 2y = 1$ are parallel, perpendicular, or neither.

- a) parallel b) perpendicular c) neither

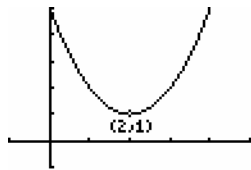
20. Which of the following could represent the graph of $y = x^2 - b$?



21. Which of the following could represent the graph of $x^2 - y^2 = 1$?



22. Determine the domain and range of the following graph:

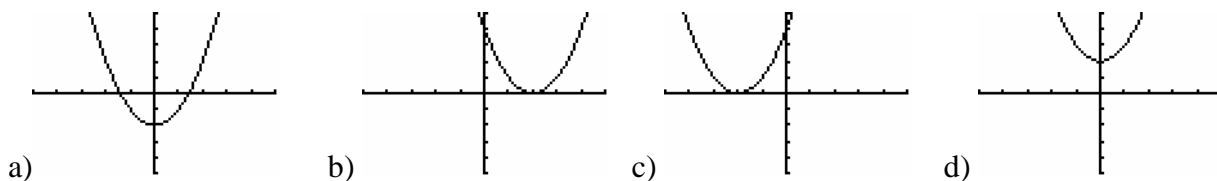


- a) Domain = $(-\infty, \infty)$, Range = $[1, \infty)$ b) Domain = $(-\infty, \infty)$, Range = $(1, \infty)$
 c) Domain = $[1, \infty)$, Range = $(-\infty, \infty)$ d) Domain = $(1, \infty)$, Range = $(-\infty, \infty)$

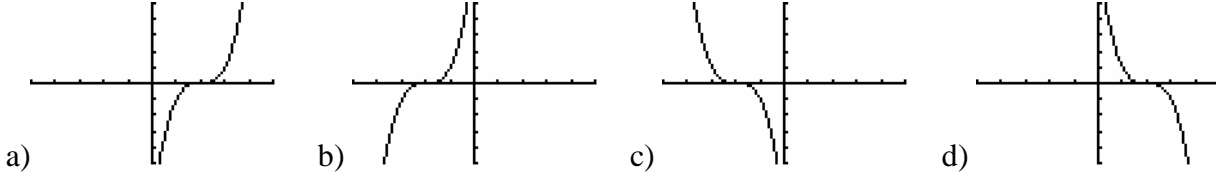
23. Which of the following best describes the set $\{(3, 2), (-1, 5), (5, 7), (2, 6), (4, -6)\}$?

- a) finite set b) one-to-one function c) function d) a, b, and c

24. Which of the following is the graph of $y = x^2 + 2$?



25. Which of the following is the graph of $y = (x-2)^3$?



D. Applications and other algebra topics

26. Find the product: $\sqrt{-5} \cdot \sqrt{-7}$

- a) $\sqrt{35}$ b) $-\sqrt{35}$ c) $i\sqrt{35}$ d) $\sqrt{35}i$

27. Simplify $(6-2i)^2$.

- a) $40-24i$ b) $36+4i^2$ c) $32-24i$ d) 40

28. Find the value of $\sum_{k=1}^3 (k^2 + 1)$.

- a) 15 b) 16 c) 17 d) 18

29. Determine the value of x in the geometric sequence $\left\{1, -\frac{2}{3}, \frac{4}{9}, -\frac{8}{27}, x\right\}$.

- a) $\frac{12}{36}$ b) $-\frac{12}{36}$ c) $-\frac{16}{81}$ d) $\frac{16}{81}$

30. Evaluate $|A|$ for $A = \begin{bmatrix} 6 & -3 \\ 2 & 3 \end{bmatrix}$.

- a) 8 b) -12 c) 17 d) 24

31. Which of the following matrices does not have an inverse?

- a) $\begin{bmatrix} 6 & 5 \\ 3 & 2 \end{bmatrix}$
 b) $\begin{bmatrix} -1 & 2 \\ -2 & 4 \end{bmatrix}$
 c) $\begin{bmatrix} 7 & 6 \\ 1 & 1 \end{bmatrix}$
 d) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

32. How many ways can you arrange 4 books on a shelf?

- a) 30 b) 6 c) 10 d) 24

33. How many 3 letter passwords can be formed from the letters A, B, C, D, E?

- a) 120 b) 60 c) 20 d) 12

34. How many different committees of 3 people can be formed from a pool of 7 people?

- a) 21 b) 10 c) 35 d) 238

35. Anoka Ramsey Community College needs two additional faculty members, one in biology and one in math. In how many ways can these two positions be filled if there are four applicants for the biology position and five for the math position?

- a) 20 b) 9 c) 40 d) 11

36. For what values of x is $\frac{x^2 - 4x + 3}{x^2 + x - 2}$ undefined?

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

37. Where defined, $\frac{1 - \frac{1}{y}}{\frac{1}{y}}$ reduces to

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

38. A rectangular garden is 12 feet long. If its area is 120 ft^2 , what is the width of the garden?

- a) 108 feet b) 10 feet c) 12 feet d) 32 feet

39. A boat on a river travels downstream between two points, 20 miles apart, in one hour. The return trip against the current takes $2 \frac{1}{2}$ hours. What is the speed of the boat?

- a) 8 mi/hr b) 16 mi/hr c) 14 mi/hr d) 10 mi/hr

E. Functions and trigonometry

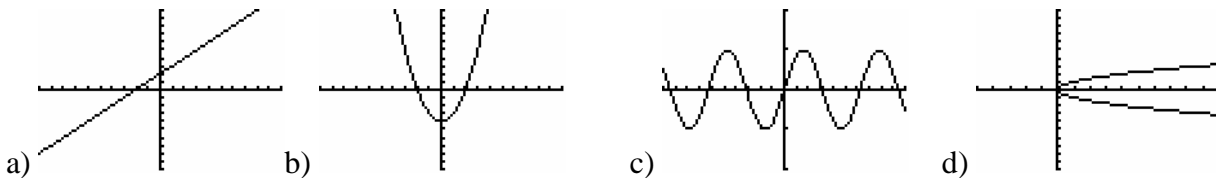
40. Find the x -intercepts of $f(x) = 4x^2 + x - 3$.

- a) 0.75 and 1 b) 0.75 and -1 c) -0.75 and -1 d) -0.75 and 1

41. Find the y -intercept(s) of $f(x) = x^3 + 2x^2 - 5x + 6$.

- a) 6 b) -5 c) -4 d) 0

42. Which of the following is NOT the graph of a function?



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

- a) $a^2 - 3a + 10$ b) $a^2 - 3a - 4$ c) $a^2 - 3a + 4$ d) $a^2 - 3a + 12$

44. If $\frac{1}{64} = 2^x$, then $x =$

- a) 6 b) -6 c) -5 d) 5

45. The graph of the function $f(x) = e^x - 1$ is

a) always positive b) always negative c) always increasing d) always decreasing

46. Express the equation in logarithmic form: $5^3 = 125$

a) $\log 5^3 = 125$ b) $\log_3 125 = 5$ c) $\log_5 3 = 125$ d) $\log_5 125 = 3$

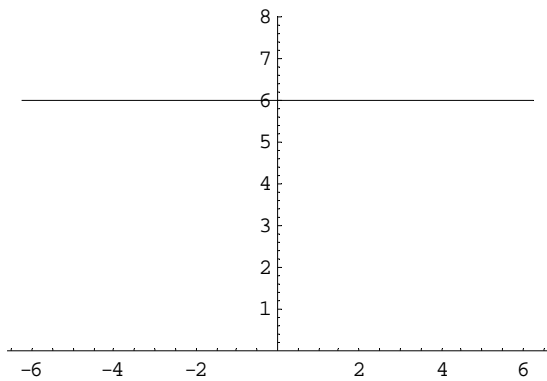
47. Evaluate the expression: $\log_4 64$

a) 16 b) 32 c) 4 d) 3

48. Which of the following equals $\frac{1}{2}$?

a) $\sin 30^\circ$ b) $\cos 30^\circ$ c) $\tan 30^\circ$ d) $\sin 60^\circ$

49. The following is a graph of $y = \sin^2 x + \cos^2 x + k$. Find the value of k .



a) 1 b) 6 c) 4 d) 5

50. How many lines with a slope of -1 are tangent to the circle $x^2 + y^2 = 25$?

a) 4 b) 0 c) 2 d) 1