

Pre-Calculus Practice Placement Exam

There are 30 questions on 5 distinct pages. You have to answer either 21 or more questions correctly to be successful in the exam. In the following multiple choice question, circle the choice that best completes the statement or answers the questions from the choices, A), B), C), or D).

Name:

TAMIU ID No.

- Write the equation of a circle with a center $(-5, -5)$ and radius $\sqrt{3}$.
 - $(x + 5)^2 + (y + 5)^2 = \sqrt{3}$
 - $(x - 5)^2 + (y - 5)^2 = \sqrt{3}$
 - $(x + 5)^2 + (y + 5)^2 = 3$
 - $(x - 5)^2 + (y - 5)^2 = 3$
- State the domain of $h(x) = (g \circ f)(x)$ if $f(x) = \sqrt{x+2}$ and $g(x) = 3x - 5$.
 - $[0, \infty)$
 - $[-2, \infty)$
 - $[1, \infty)$
 - $(-\infty, \infty)$
- Find the inverse, f^{-1} if $f(x) = \sqrt{x+2}$.
 - $f^{-1}(x) = x^2 - 2, x \geq 0$
 - $f^{-1}(x) = x^2 - 2, x \geq -2$
 - $f^{-1}(x) = (x - 2)^2, x \geq -2$
 - $f^{-1}(x) = \sqrt{x-2}$
- Adult tickets for a play cost \$18 and child tickets cost \$10. If there are 24 people at a performance and the theater collected \$376 from ticket sales, how many children attended the play?
 - 6 children
 - 7 children
 - 8 children
 - 17 children
- Write an equation of the line passing through $(-8, -3)$, and perpendicular to the line, $y = \frac{1}{4}x + 2$. Write your answer in standard form $Ax + By = C$, $A \geq 0$.
 - $4x + y = -35$
 - $4x - y = -35$
 - $x + 4y = -20$
 - $x - 4y = -20$
- Divide and write your answer in standard form. $\frac{11}{4+3i}$.
 - $\frac{11}{4} + \frac{11}{3}i$
 - $\frac{44}{25} - \frac{33}{25}i$
 - $\frac{44}{7} - \frac{3}{7}i$
 - $\frac{44}{25} - \frac{3}{25}i$

7. Find a polynomial of lowest degree, with leading coefficient 1 that has the indicated graph. Assume all zeros are integers.



- A) $P(x) = -(x + 1)(x - 2)$
 B) $P(x) = -(x + 1)^2(x - 2)$
 C) $P(x) = -(x + 1)(x - 2)^2$
 D) $P(x) = -(x + 1)(x^2 - 2)$
8. Use long division to compute the quotient (Q) and remainder (R) of the polynomial division given by $(2x^3 - 5x - 2) \div (x + 1)$.
- A) $Q = 2x^2 - 4x - 3, R = 1$
 B) $Q = 2x^2 - 2x - 3, R = 1$
 C) $Q = 2x^2 - 4x + 3, R = -1$
 D) $Q = 2x^2 - 2x + 3, R = -1$
9. Find the inverse of the matrix, if it exists. $A = \begin{bmatrix} 6 & -3 \\ -4 & 2 \end{bmatrix}$.
- A) $A^{-1} = \begin{bmatrix} 2 & 3 \\ 4 & 6 \end{bmatrix}$
 B) $A^{-1} = \begin{bmatrix} -6 & -4 \\ -3 & -2 \end{bmatrix}$
 C) $A^{-1} = \begin{bmatrix} 2 & -4 \\ -3 & 6 \end{bmatrix}$
 D) The inverse does not exist.
10. Solve the equation for x : $20 + 10(x - 7) = 5(x + 4) + 5x$.
- A) $\frac{7}{20}$
 B) $\frac{7}{2}$
 C) $-\frac{7}{2}$
 D) No solution
11. Solve for x provided in the absolute value equation, $|3x - 7| = 8 - 2x$.
- A) $x = 3$ and 5
 B) $x = 5$
 C) $x = 3$
 D) $x = 3$ and -1
12. Write your answer in the interval notation. $x^2 + 6x + 3 > 0$.
- A) $(-\infty, -3 - \sqrt{6}) \cup (-3 + \sqrt{6}, \infty)$
 B) $(-\infty, -3 - \sqrt{36}) \cup (-3 + \sqrt{6}, \infty)$

C) $(-\infty, -3 - \sqrt{6}) \cap (-3 + \sqrt{6}, \infty)$

D) $(-\infty, 3 - \sqrt{6}) \cup (3 + \sqrt{6}, \infty)$

13. Solve for x . $\left(\frac{2}{5}\right)^{7-x} = \frac{5}{2}$.

A) 6

B) 7

C) 8

D) -7

14. Write in logarithmic form: $64 = 4^3$.

A) $\log_4 3 = 64$

B) $\log_3 4 = 64$

C) $\log_4 64 = 3$

D) $\log_{64} 4 = 3$

15. Find all vertical and horizontal asymptotes.

$$f(x) = \frac{4x^2 - 4}{x^2 - 16}$$

A) Vertical asymptotes: $x = \pm 4$; Horizontal asymptote: $y = 4$

B) Vertical asymptotes: $x = 4$; Horizontal asymptote: $y = -4$

C) Vertical asymptotes: $x = \pm 4$; Horizontal asymptote: $y = -4$

D) Vertical asymptotes: $x = -4$; Horizontal asymptote: $y = 4$

16. Solve. Write the solution in interval notation. $|2x - 10| \geq 4$.

A) $(-\infty, 3] \cup [7, \infty)$

B) $(-\infty, 3] \cap [7, \infty)$

C) $(6, 14)$

D) $[3, 7]$

17. Solve for x by factoring the equation, $6x^2 + 7x - 3 = 0$.

A) $-\frac{1}{2}, 1$

B) $\frac{1}{2}, -1$

C) $-\frac{2}{3}, \frac{1}{3}$

D) $-\frac{3}{2}, \frac{1}{3}$

18. Simplify the exponential expansion given by, $e^{\ln(3) - \ln(2) + \ln(1/x)} = ?$

A) $3 / (2x)$

B) $3x/2$

C) $1 + 1/x$

D) $3/2 - 1/x$

19. Find the complete solution of the linear system.

$$\begin{cases} 2x + 4y - z = 2 \\ x + 2y - 3z = -4 \\ 3x - y + z = 1 \end{cases}$$

A) $(0, -1, -2)$

B) $(0, 1, -2)$

C) No solution

D) $(0, 1, 2)$

20. Let $h(x) = x^3 + 3x^2 - x - 3$. What is the factored form of the polynomial?
- A) $(x - 3)(x + 1)(x + 1)$
 B) $(x - 3)(x - 1)(x - 1)$
 C) $(x + 3)(x + 1)(x - 1)$
 D) $(x - 3)(x - 1)(x + 1)$
21. Which one of the following is equal to $\sec^2\theta$ =
- A) $1 - \cos^2\theta$
 B) $1 - \tan^2\theta$
 C) $1 + \tan^2\theta$
 D) $1 + \cot^2\theta$
22. The terminal side of an angle θ in standard position passes through the point $(4, 3)$. Find $\sin \theta$.
- A) $\frac{3}{5}$
 B) $\frac{5}{3}$
 C) $\frac{4}{5}$
 D) $\frac{5}{4}$
23. Let θ be the measure of an angle in standard position with its terminal side in Quadrant III and $\sin \theta = -\frac{1}{2}$. Find $\tan \theta$.
- A) $\sqrt{3}$
 B) $\frac{1}{\sqrt{3}}$
 C) $\frac{2}{3}$
 D) $-\frac{1}{\sqrt{3}}$
24. If $\sin \theta = -\frac{1}{5}$ what is $\csc \theta$?
- A) $\frac{1}{5}$
 B) 5
 C) 0
 D) -5
25. For an angle $\phi = 260$ in standard position, find the measure of its reference angle.
- A) 10°
 B) 80°
 C) -80°
 D) -100°
26. In right $\triangle ABC$, $A=60^\circ$, $C=90^\circ$, $c=17$. Find b to the nearest tenth.
- A) 8.50
 B) 13.5
 C) 14.5
 D) 15.5

27. Change 150° to radian measure in terms of π .

A) $\frac{6\pi}{5}$

B) $\frac{3\pi}{5}$

C) $\frac{5\pi}{6}$

D) $\frac{5\pi}{3}$

28. What is the value of $y = \sin \pi + \cos \pi$.

A) 0

B) -1

C) 1

D) undefined

29. Which of the following is a trigonometric identity?

A) $\csc x = \sin x \cos x$

B) $\csc x = \cos x \cot x$

C) $\frac{1}{\csc x} = \cos x \cot x$

D) $\frac{1}{\csc x} = \cos x \tan x$

30. What is $\cos(\pi - \theta)$?

A) $\sin \theta$

B) $-\sin \theta$

C) $-\cos \theta$

D) $\cos \theta$