

Sample UIC Mathematics Placement Test

This sample test contains 15 questions. Allow yourself 18 minutes.

1. Find the value of $7 - 2(-2) - 12$.

- (A) -9 (B) 1 (C) -21 (D) -1 (E) 21

2. Divide and reduce to lowest terms: $\frac{3}{6} \div \frac{6}{5}$.

- (A) $\frac{5}{30}$ (B) $\frac{5}{12}$ (C) $-\frac{1}{3}$ (D) 6 (E) $\frac{12}{5}$

3. $\sqrt{(4^2 + 3^2)}$ can be simplified to:

- (A) 7 (B) 14 (C) $\sqrt{7}$ (D) 5 (E) $\sqrt{5}$

4. Using the laws of exponents, divide 3^{27} by 3^{25} .

- (A) 3 (B) $2^{6/5}$ (C) 9 (D) 27 (E) 81

5. Evaluate $8 - 2(3a + 4)$ if $a = 3$.

- (A) 6 (B) -18 (C) 34 (D) 18 (E) 81

6. If $f(x) = 5x^2 - 11$ then $f(a - 2)$ equals:

- (A) $5a^2 - 11$ (B) $5a^2 - 13$ (C) $5a^2 - 20a + 9$ (D) $5a - 11$ (E) $5a^2 - 22$

7. Determine k if -3 is a root of $2x^2 + kx + 9 = 0$.

- (A) -2 (B) 3 (C) -3 (D) 6 (E) 9

8. The area of a rectangle is 200 feet; one side is 8 feet longer than the other. An equation to find the length of the shorter side is.

- (A) $x(x - 8) = 200$ (B) $x(x + 8) = 200$ (C) $2x + 2(x + 8) = 200$
(D) $2x + 2(x - 8) = 200$ (E) $x(x + 8) = 2x + 2(x + 8)$

9. $\frac{\sqrt{3x + 2}}{(3x + 2)^{7/2}}$ can be simplified to:

- (A) $\frac{1}{\sqrt{3x + 2}}$ (B) $(3x + 2)^{-3}$ (C) $(3x + 2)^3$ (D) $(3x + 2)^{-7}$ (E) 1

10. Solve for B : $A = \frac{3B}{kB + D}$

- (A) $\frac{-AD}{kA - 3}$ (B) $\frac{AD}{kA - 3D}$ (C) $\frac{A(kB + D)}{3}$ (D) $\frac{AD}{kA - 3kD}$ (E) $\frac{kA}{3D}$

11. If $N = \frac{8A^{1/4}}{C^3}$ then $\log N$ is:

- (A) $2 \log A - 3 \log C$ (B) $\frac{\log A + 2 \log 8}{-3 \log C}$ (C) $\log A + 8 \log 2 - 3 \log C$
(D) $\frac{\log A + 2 \log 8}{3 \log C}$ (E) $\frac{1}{4} \log A + \log 8 - 3 \log C$

12. If $f(x) = x^2 + 3x + 1$ and $g(x) = x - 1$, then $f(g(x))$ is:

- (A) $x^2 + 3x$ (B) $x^3 + 2x^2 - 2x - 1$ (C) $x^2 + x - 1$
(D) $x^3 - 3x$ (E) $x^2 + 2x + 2$

13. If $\cos x = a/3$ and $0 < x < \pi/2$, then $\tan x$ is:

- (A) $3/a$ (B) $\frac{\sqrt{9 - a^2}}{3a}$ (C) $\frac{9\sqrt{9 - a^2}}{a}$ (D) $\frac{\sqrt{9 - a^2}}{a}$ (E) $\frac{a}{\sqrt{3 - a}}$

14. The solutions of $\sin^2 x + \cos x = 1$ with $0 \leq x < 2\pi$ are:

- (A) 0 and $\pi/2$ only (B) 0 and π only (C) 0, $\pi/2$, and $3\pi/2$ only
(D) $\pi/3$ and $2\pi/3$ only (E) 0, $\pi/2$ and π only

15. Simplify the trigonometric expression $(\cos^2 x)(\tan x + \cot x)$

- (A) $3 \csc x$ (B) $\sin x + 1$ (C) 1 (D) $\cot x$ (E) $2 \cot x$