# Calculus Readiness Test

**Directions:** You should plan on finishing the exam in under 1 hour. Part of the needs of Calculus 1 are not only to know certain algebra and trigonometry topics, but be able to fairly quickly have them at your fingertips. The thread of calculus can easily be lost if you are struggling with the necessary background mathematics. Once you have taken your practice test, check your answers with the correct ones given on the reverse side of this sheet.

Once you have taken your practice test, check your answers with the correct ones given below, and then check the topical list to determine your deficiencies.

1. If $0° \leq x < 90°$, then $\tan x \cos x$ simplifies to:

   A) $\sin x$      B) $\cos x$      C) $\cot x$      D) $\sec x$      E) $\csc x$

2. The expression $\dfrac{(x^4 y^{-3})^2}{x^3 y^5}$ simplifies to:

   A) $\dfrac{x^3}{y^6}$      B) $\dfrac{x^5}{y^{11}}$      C) $\dfrac{x^2}{y^{16}}$      D) $x^9 y^{-6}$      E) None of these.

3. If $f(x) = 2^x$, and $a$ and $b$ are any positive numbers, then $f(a+b)$ is equivalent to:

   A) $f(a) \cdot f(b)$      B) $\dfrac{f(a)}{f(b)}$      C) $f(a^b)$      D) $f(a) + f(b)$      E) None of these.

4. The domain of $g(x) = \dfrac{1}{\sqrt{3-x}}$ is:

   A) $[3, \infty)$      B) $(3, \infty)$      C) $(-\infty, 3]$      D) $(-\infty, 3)$      E) None of these.

5. The angle $150°$ in radian measure is given by:

   A) $\dfrac{5\pi}{12}$      B) $\dfrac{6}{5\pi}$      C) $75\pi$      D) $\dfrac{5\pi}{6}$      E) None of these.

6. Solve for $x$:      $6.4x - 3.2 = 4.4x + 1.2$

   A) $x = -2.2$      B) $x = 2$      C) $x = -1$      D) $x = 1.1$      E) None of these.

7. One solution to the equation $3x^2 + x - 5 = 0$ is:

   A) $\dfrac{-1 + i\sqrt{61}}{6}$      B) $\dfrac{1 + i\sqrt{61}}{6}$      C) $\dfrac{-1 + \sqrt{61}}{6}$      D) $\dfrac{1 - \sqrt{61}}{6}$      E) None of these.

8. What is the number $(.01)^{-\frac{1}{2}}$ equal to?

   A) .01      B) 10      C) 1000      D) .1      E) 100

**9.** If $f(x) = x^2$ and $g(x) = x^3 + 2x$, what is the compostion $(f \circ g)(x)$?

A) $x^5 + 2x^3$    B) $\left(x^3 + 2x\right)^2$    C) $x^6 + 4x^2$    D) $\dfrac{x^3 + 2x}{x^4}$    E) None of these.

**10.** Solve $\log_{10}(x - 1) = 2$ for $x$.
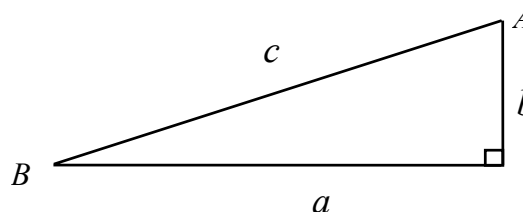
A) 1025    B) 21    C) 101    D) 99    E) None of these.

**11.** The function $f(x) = \cot x$ is not defined for:

A) $x = 0$    B) $x = \dfrac{\pi}{4}$    C) $x = \dfrac{\pi}{2}$    D) $x = \dfrac{\pi}{3}$    E) None of these.

**12.** In the right triangle shown, $a = 8$ and $c = 10$, find $\tan A$

A) $\dfrac{5}{3}$    B) $\dfrac{3}{5}$    C) $\dfrac{3}{4}$

D) $\dfrac{4}{3}$    E) None of these.

**13.** One solution to the equation $\dfrac{x - 4}{5x + 15} = \dfrac{1}{x + 3}$ is:

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

**14.** The expression $\dfrac{\dfrac{1}{b^2} + a^2}{\dfrac{1}{a^2} + b^2}$ simplifies to:    (Ignore the domain change when simplified.)

A) $\dfrac{1 + a^4}{1 + b^4}$    B) $\dfrac{b^2 + a^2}{a^2 b^2}$    C) $\dfrac{b^2}{a^2}$    D) $\dfrac{a^2}{b^2}$    E) None of these.

**15.** Find the equation of the line through the two points (5,3) and (–1,6).

A) $y = \dfrac{1}{2}x + \dfrac{11}{2}$    B) $y = -\dfrac{1}{2}x + \dfrac{11}{2}$    C) $y = 2x + 8$

D) $y = -2x + 4$    E) None of these.

**16.** If $f(x) = 5x - 2$, the inverse function is:

A) $f^{-1}(x) = \dfrac{1}{5}x + 2$    B) $f^{-1}(x) = \dfrac{x + 2}{5}$    C) $f^{-1}(x) = \dfrac{1}{5}x - \dfrac{1}{2}$    D) $f^{-1}(x) = 2x - 5$

E) None of these.

**17.** $x^{-3} - y^{-3}$ is equivalent to:

A) $(x - y)^{-3}$    B) $\dfrac{x^3 y^3}{x^3 - y^3}$    C) $\dfrac{1}{(x - y)^3}$    D) $\dfrac{y^3 - x^3}{x^3 y^3}$    E) None of these.

**18.** The expression $x^4 y - xy^4$ may be factored as:

A) $(x - y)(x^2 - y^2)(x^2 + y^2)$    B) $xy(x - y)^3$    C) $xy(x - y)(x^2 + xy + y^2)$

(Sample)

D) $(x^2 y - x y^2)^2$               E) None of these.

**19.** The exact value of $\cos \dfrac{4\pi}{3}$ is

     A) $\dfrac{\sqrt{3}}{2}$          B) $-\dfrac{\sqrt{3}}{2}$          C) $\dfrac{1}{2}$          D) $-\dfrac{1}{2}$          E) None of these.

**20.** The expression $\log_2 2x - 2\log_2 y + \log_2 z$ is equivalent to:

     A) $\log_2\left(\dfrac{2xz}{y^2}\right)$          B) $\log_2\left(\dfrac{xz}{y}\right)$          C) $\log_2\left(2x - y^2 + z\right)$          D) $\dfrac{\log_2 2x \log_2 z}{2\log_2 y}$

     E) None of these.