

September 2, 2026

National Blueberry Popsicle Day

Today in History:

First ATM opens (1969)

The Great Fire of London begins (1666)

Number of the Day: 15

15 = 3×5 (semi-prime)

15 is the magic constant (the sum of any row, column, or diagonal) for the standard 3×3 Magic Square.

Fun Fact:

Sharks are older than trees.

Quote of the Day:

"If the Good Lord intended for us to walk, he wouldn't have invented roller skates."

Gene Wilder - "Willy Wonka & The Chocolate Factory"

Today's Weather:

Heat advisory until 8:00pm, High 90°.

Math 121

Quiz #6

Find the value of c so that $f(x)$ is continuous.

$$f(x) = \begin{cases} x^2 - c & \text{if } x < 5 \\ 4x + 2c & \text{if } x \geq 5 \end{cases}$$

$$\lim_{x \rightarrow 5^-} f(x) = \lim_{x \rightarrow 5^-} x^2 - c = 25 - c$$

$$\lim_{x \rightarrow 5^+} f(x) = \lim_{x \rightarrow 5^+} 4x + 2c = 20 + 2c$$

$$25 - c = 20 + 2c$$

$$5 = 3c \quad c = \frac{5}{3}$$

$$(35) \quad y = \underbrace{\tan}_{\text{green squiggle}}(\underbrace{\sin x}_{\text{blue squiggle}})$$

$\tan x$ IS NOT $x = \pm \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2} \dots$

$$-1 \leq \sin x \leq 1$$

Computing Limits

$$(1) \quad \lim_{x \rightarrow 3} x^2 + 4x + 5 = 26$$

$$(2) \quad \lim_{x \rightarrow 2} \frac{x^2 + 1}{x + 3} = 1$$

$$(3) \quad \lim_{x \rightarrow 3} \frac{x^2 - 2x - 3}{x - 3} = \lim_{x \rightarrow 3} \frac{\cancel{(x-3)}(x+1)}{\cancel{(x-3)}} = 4$$

$$(4) \quad \lim_{x \rightarrow -1} \frac{x+1}{x^2 - x - 2} = \lim_{x \rightarrow -1} \frac{\cancel{(x+1)}}{\cancel{(x+1)}(x-2)} = \frac{1}{-3} = -\frac{1}{3}$$

$$(5) \quad \lim_{x \rightarrow 3} \frac{\frac{1}{x} - \frac{1}{3}}{x - 3} = \lim_{x \rightarrow 3} \frac{\frac{3-x}{3x}}{x-3}$$

$$= \lim_{x \rightarrow 3} \frac{\overset{-1}{\cancel{3-x}}}{(3x)(\cancel{x-3})} = \frac{-1}{9}$$

$$\textcircled{6} \quad \lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2} \cdot \frac{(\sqrt{x}+2)}{(\sqrt{x}+2)}$$

$$= \lim_{x \rightarrow 4} \frac{(\cancel{x-4})(\sqrt{x}+2)}{(\cancel{x-4})} = 4$$

$$\textcircled{7} \quad \lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2} = \lim_{x \rightarrow 4} \frac{\cancel{(\sqrt{x}-2)}(\sqrt{x}+2)}{(\cancel{\sqrt{x}-2})} = 4$$

$$\textcircled{8} \quad \lim_{x \rightarrow 0} \frac{\sqrt{x+4}-2}{x} \cdot \left(\frac{\sqrt{x+4}+2}{\sqrt{x+4}+2} \right)$$

$$= \lim_{x \rightarrow 0} \frac{\cancel{x+4}-\cancel{4}}{x(\sqrt{x+4}+2)} = \frac{1}{4}$$

$$\textcircled{9} \quad \lim_{x \rightarrow 1} \left(\frac{1}{1-x} - \frac{2}{1-x^2} \right)$$

$$\lim_{x \rightarrow 1} \left(\frac{1}{1-x} \left(\frac{1+x}{1+x} \right) - \frac{2}{1-x^2} \right)$$

$$= \lim_{x \rightarrow 1} \left(\frac{1+x}{1-x^2} - \frac{2}{1-x^2} \right)$$

$$= \lim_{x \rightarrow 1} \left(\frac{x-1}{1-x^2} \right)$$

$$= \lim_{x \rightarrow 1} \frac{x-1}{(1-x)(1+x)}$$

$$= \lim_{x \rightarrow 1} \frac{-\cancel{(1-x)}}{\cancel{(1-x)}(1+x)} = \frac{-1}{2}$$

$$\textcircled{10} \quad \lim_{x \rightarrow 0} \frac{\sin x}{\tan x}$$

$$= \lim_{x \rightarrow 0} \frac{\sin x}{\frac{\sin x}{\cos x}}$$

$$= \lim_{x \rightarrow 0} \left(\cancel{\sin x} \right) \left(\frac{\cos x}{\cancel{\sin x}} \right) = 1$$

$$\textcircled{11} \quad \lim_{x \rightarrow \frac{\pi}{2}} (\sec x - \tan x)$$

$$= \lim_{x \rightarrow \frac{\pi}{2}} \left(\frac{1}{\cos x} - \frac{\sin x}{\cos x} \right)$$

$$= \lim_{x \rightarrow \frac{\pi}{2}} \frac{1 - \sin x}{\cos x} \left(\frac{1 + \sin x}{1 + \sin x} \right)$$

$$= \lim_{x \rightarrow \frac{\pi}{2}} \frac{1 - \sin^2 x}{\cos x (1 + \sin x)} = \lim_{x \rightarrow \frac{\pi}{2}} \frac{\cancel{\cos^2 x}}{\cancel{\cos x} (1 + \sin x)}$$

$$= \frac{0}{2} = 0$$

IF $\frac{0}{0}$ LOOK TO CANCEL

$$\text{IF } \frac{0}{\cancel{x}} = 0$$

$$\text{IF } \frac{\cancel{x}}{0} = \text{D.N.E.}$$

$$\cancel{x} \neq 0$$