Math Superpowers for Every Student
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CALCULUS

Calculus is coming, start hiding!!!

Or you could download Photomath and scan the expressions bellow to quickly freshen your math skills. Either way works.

Question 1. The graph of the equation

$$y = \frac{-5}{x - 2}$$

is concave downward for all values of x such that:

    A. $x < 0$ **B.** $x < 2$ **C.** $x < 5$ **D.** $2\,x > 2$ **E.** $x > 2$

Question 2. For the following functions, find the domain and the y-intercept.

$y = e^{\frac{3x}{2x-1}} \sqrt[3]{x - 7}$

$y = x \log_3(5x - 2)$

Question 3. Which of the following function are continuous for all real numbers x?

a.) $y = x^{\frac{5}{3}}$ **b.)** $y = \sqrt[3]{3x - 1}$ **c.)** $y = \frac{3x-1}{4x^2+5}$

A. None of these **B.** a.) only **C.** b.) only

D. a.) and b.) only **E.** a.), b.) and c.)

Question 4. Evaluate each limit.

$$\lim_{x \to \infty} \frac{x^2 + 5x + 6}{x^2 - 4}$$

$$\lim_{x \to 1} \sqrt[3]{\frac{3k - 5}{25k - 2}}$$

$$\lim_{x \to \frac{1}{3}} \frac{3x^2 - 7x + 2}{-6x^2 + 5x - 1}$$

$$\lim_{x \to \infty} \left(\sqrt{x + 1} - \sqrt{1} \right)$$

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Question 5. Find the limit.

$$\lim_{x \to} \frac{x^2 - 8}{x^2 - 4}$$

A. 4 **B.** 0 **C.** 1 **D.** 3 **E.** 4

Question 6. Find the derivative for each of the following equations.

Hint: Substitute $y =$ with $\frac{d}{dx}$ in the editing tool on Photomath to solve the derivative!

$y = 2\sin(x)\cos(x)$

$y = \tan(x) - x$

$y = \tan^3(x)$

$y = 3\cos(x)$

Question 7. If $x + 2xy - y^2 = 2$, **then at the point** $(1, 1)$, $\dfrac{d}{dx}$ **is:**

Hint: First find the derivative of the equation using the $\frac{d}{dx}$ function in the editor, and then substitute in the values for the point $(1, 1)$.

A. $\dfrac{3}{2}$ **B.** $\dfrac{1}{2}$ **C.** 0 **D.** $-\dfrac{3}{2}$ **E.** Nonexistent

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Question 8. If $y = \ln(x\sqrt{x^2 + 1})$, **then** $\dfrac{dy}{dx} =$

A. $1 + \dfrac{x}{x^2 + 1}$

B. $1 + \dfrac{1}{x\sqrt{x^2 + 1}}$

C. $\dfrac{2x^2 + 1}{x\sqrt{x^2 + 1}}$

D. $\dfrac{2x^2 + 1}{x^3 + x}$

Question 9. Calculate the derivative:

$$\frac{d}{dx}\left((x^2 - 2x + 2)e^x\right)$$

$$\frac{d}{dx}\left(\sqrt{2} \cdot \sin(3x)\right)$$

Question 10. Calculate the derivative:

$$\int \frac{7\sqrt{x} - 3x^2 - 3}{4\sqrt{x}}\,dx$$

$$\int_{-\frac{\pi}{3}}^{\frac{\pi}{3}} 4\sec(\theta)\tan(\theta)\,d\theta$$

$$\int_{0}^{\frac{\pi}{2}} \cos\left(\frac{2x}{2}\right)$$