Question 1

Apply the rules of limits to evaluate

$\lim_{x \to 8} (2x^2 - 9x + 9) =$ ____ .

Question 2

Apply the rules of limits to evaluate $\lim_{x \to 9} \frac{2x^3 - 5x + 3}{5x^2 + 7}$.

$\lim_{x \to 9} \frac{2x^3 - 5x + 3}{5x^2 + 7} =$ ____

Question 3

Evaluate $\lim_{x \to 4} \frac{x^2 - 16}{4 - x} =$ ____

Question 4

Give your final answer in terms of *e*.

Evaluate the indicated limit.

$\lim_{x \to 0} \frac{xe^{-6x + 4}}{x^2 + x}$

Question 5

Evaluate the indicated limit.

$\lim_{x \to 5} \frac{x^3 - 125}{x^2 + 4x - 45}$

Question 6

Evaluate $\lim_{x \to 0} \dfrac{\sqrt{x + 3} - \sqrt{3}}{x}$.

Question 7

Evaluate the indicated limit.

$\lim_{x \to 0} \dfrac{\sqrt{x + 144} - 12}{x}$

Question 8

Evaluate $\lim_{x \to 0} (6x \cot x)$.

$\lim_{x \to 0} (6x \cot x) =$ _____

Question 9

Evaluate $\lim_{x \to 0} f(x)$, **where** f **is defined by**

$$f(x) = \begin{cases} x^2 + 3 \cos x + 6, & \text{for } x < 0 \\ e^x + 8, & \text{for } x \geq 0 \end{cases}.$$

A. $\lim_{x \to 0} f(x) = -7$

B. $\lim_{x \to 0} f(x)$ **does not exist.**

C. $\lim_{x \to 0} f(x) = 2$

D. $\lim_{x \to 0} f(x) = 9$

Question 10

Evaluate the indicated limit, if it exists.

$\lim_{x \to 7} f(x)$, where $f(x) = \begin{cases} 7x & \text{if } x < 7 \\ x^2 & \text{if } x \geq 7 \end{cases}$

A. $\lim_{x \to 7} f(x) = 0$

B. $\lim_{x \to 7} f(x)$ does not exist.

C. $\lim_{x \to 7} f(x) = 6$

D. $\lim_{x \to 7} f(x) = 49$

Question 11

Determine where $f(x) = \dfrac{x^2 + 3x - 54}{x - 6}$ **is continuous.**

A. $f(x)$ is continuous for $x < -6$ and $x > -6$ (but not at $x = -6$).

B. $f(x)$ is continuous for $x < 9$ and $x > 9$ (but not at $x = 9$).

C. $f(x)$ is continuous for $x < -9$ and $x > -9$ (but not at $x = -9$).

D. $f(x)$ is continuous for $x < 6$ and $x > 6$ (but not at $x = 6$).

Question 12

Make the function

$$f(x) = \frac{x^2 + 2x - 48}{x - 6}$$

continuous everywhere by redefining it at a single point. What is the point?

The point is (____ , ____).

Question 13

Determine where *f* is continuous, for $f(x) = \frac{x^4 + x^2 - 2}{x^2 - 2x - 3}$.

A. *f* is continuous for $x \neq 1, 3$.

B. *f* is continuous for $x \neq -3$.

C. *f* is continuous for $x \neq -1, 3$.

D. *f* is continuous for $x \neq 1, -3$.

Question 14

Determine the interval(s) where $f(x) = \ln(x + 21)$ is continuous.

A. *f* is continuous on the interval $[-21, \infty)$.

B. *f* is continuous on the interval $(-21, \infty)$.

C. *f* is continuous on the intervals $(-\infty, -21)$ and $(-21, \infty)$.

D. *f* is continuous on the intervals $(-\infty, -21]$ and $[-21, \infty)$.

Question 15

Determine the interval at which $f(x)$ is continuous, for $f(x) = \sqrt{x^2 - 7}$.

Write your answer in interval notation.

f is continuous on the interval ____ and ____ .

Question 16

Suppose that a state's income tax code states that the tax liability on *x* dollars of taxable income is given by

$$\begin{cases} 0 & \text{if } x \leq 0 \end{cases}$$

$$T(x) = \begin{cases} 0.15x & \text{if } 0 < x < 5000 \\ c + 0.26x & \text{if } 5000 \leq x \end{cases}$$

Determine the constant *c* that make this function continuous at all *x*.

***c* = ____**