



MIDTERM EXAMINATION

MTH101- Calculus And Analytical Geometry

Question No: 1 (Marks: 1) - Please choose one

The average velocity of a body is V_{ave}

☐ $\frac{d_1 - d_0}{t_1 - t_0}$

☐ $\frac{t_1 - t_0}{f(t_0) - f(t_1)}$

☐ $\lim_{t_1 \rightarrow t_0} \frac{f(t_0) - f(t_1)}{t_1 - t_0}$

☐ None of these

Question No: 2 (Marks: 1) - Please choose one

Consider two function $f(x) = x^3$ and $g(x) = (x+9)$ then $f \circ g(x) =$

☐ $(x+9)^3$

☐ $x+3$

☐ $x+9$

☐ None of these

For Registration on www.virtualinspire.com u can use Firefox or chrome or Any latest Internet Explorer.....

Question No: 3 (Marks: 1) - Please choose one

Consider two function $f(x) = x^2$ and $g(x) = \sqrt{x}$ then $f \circ g(x) =$

- ☒ x -correct
- ☐ x^2
- ☐ \sqrt{x}
- ☐ None of these

Question No: 4 (Marks: 1) - Please choose one

Consider two function $f(x) = 3\sqrt{x}$ and $g(x) = \sqrt{x}$ what is true about these functions

- ☒ $f(x).g(x) = 3x$
- ☐ $\frac{f(x)}{g(x)} = 3x$
- ☐ $f(g(x)) = 3x$
- ☐ None of these -correct

Question No: 5 (Marks: 1) - Please choose one

The centre and the radius of the circle $(x+5)^2 + (y-3)^2 = 16$ is

- ☒ $(-5,3), 4$
- ☐ $(5,-3), 16$
- ☐ $(5,-3), 4$
- ☐ None of these

Question No: 6 (Marks: 1) - Please choose one

The graph $x = y^2$ is symmetric about

- ☒ X-axis
- ☐ Y-axis
- ☐ Origin
- ☐ None of these

Question No: 7 (Marks: 1) - Please choose one

For Registration on www.virtualinspire.com u can use Firefox or chrome or Any latest Internet Explorer.....

The chain rule is used for two function f and g , if we have ----- of these function

- ▶ Product
- ▶ Sum
- ▶ Composition
- ▶ None of these

Question No: 8 (Marks: 1) - Please choose one

A function f is differentiable function if it is differentiable on the interval

- ▶ $(-\infty, \infty)$
- ▶ (a, ∞) where a is any negative integer
- ▶ $(0, \infty)$
- ▶ None of these

Question No: 9 (Marks: 1) - Please choose one

A function is said to be continuous function if the function is continuous on the interval

- ▶ $(-\infty, +\infty)$
- ▶ $(0, +\infty)$
- ▶ $(-\infty, 0)$
- ▶ None of these

Question No: 10 (Marks: 1) - Please choose one

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

- ▶ 1
- ▶ 2
- ▶ 0-correct
- ▶ 1/2

For Registration on www.virtualinspire.com u can use Firefox or chrome or Any latest Internet Explorer.....

Question No: 11 (Marks: 1) - Please choose one

For any polynomial $P(x) = c_0 + c_1x + \dots + c_nx^n$ and any real number a
 $\lim_{x \rightarrow a} P(x) = c_0 + c_1a + \dots + c_na^n =$

- ☒ $P(a)$ -correct
- ☐ $P(a+1)$
- ☐ $P(a-1)$
- ☐ $\frac{1}{P(a)}$
- ☐

Question No: 12 (Marks: 1) - Please choose one

The no of x and y intercepts for the equation $y=1/x$

- ☐ Two x intercepts
- ☐ Two y intercepts
- ☒ No x and no y intercepts-correct
- ☐ None of these

Question No: 13 (Marks: 1) - Please choose one

A line is called a tangent line to the circle if it meets the circle at precisely
.....

- ☒ One point -correct
- ☐ Two points
- ☐ Infinite points
- ☐ None of these

Question No: 14 (Marks: 1) - Please choose one

If f is a twice differentiable function at a stationary point x_0 and $f''(x_0) < 0$
then f has relative At x_0

- ☒ Minima -correct
- ☒ Maxima
- ☐ None of these

For Registration on www.virtualinspire.com u can use
Firefox or chrome or Any latest Internet Explorer.....

Question No: 15 (Marks: 1) - Please choose one

If the $\lim_{x \rightarrow a} f(x) = L$ then the inequality $(L - \varepsilon) < f(x) < L + \varepsilon$ holds in any subset of the interval

- ▶ $(a - \delta, a) \cup (a, a + \delta)$
- ▶ $(a - 1, a) \cup (a, a + 1)$
- ▶ $(a - \varepsilon, a) \cup (a, a + \varepsilon)$
- ▶ None of these

Question No: 16 (Marks: 1) - Please choose one

$$\lim_{x \rightarrow 5} \frac{\sqrt{x+4}}{x^2+2} =$$

- ▶ 0
- ▶ ∞
- ▶ 1/9
- ▶ Limit doesn't exist

Question No: 17 (Marks: 2)

$$f(x) = x^2 - 3x + 1$$

Show that $f(x)$ is a continuous function.

$$\lim_{x \rightarrow +\infty} (x^2 - 3x + 1) = +\infty$$

And

$$\lim_{x \rightarrow -\infty} (x^2 - 3x + 1) = +\infty$$

Question No: 18 (Marks: 2)

Find the range of function f defined by $f(x) = x^2 + 5$

Question No: 19 (Marks: 3)

$$y = (\cos x)^{6x}$$

Differentiate:

Question No: 20 (Marks: 5)

For Registration on www.virtualinspire.com u can use Firefox or chrome or Any latest Internet Explorer.....

Differentiate w.r.t. x by chain rule $y = \cos^2(x^3)$

Question No: 21 (Marks: 10)

Evaluate the following limit.

$$\lim_{x \rightarrow 2} \frac{x^2 + 4x - 12}{x^2 - 2x}$$