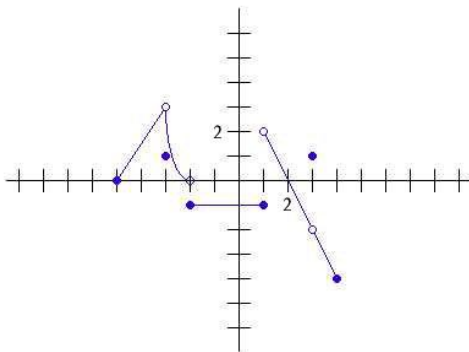


Part A: Multiple Choice (1 Mark x 30 Questions = 30 Marks)

Choose the best answer for each of the following questions. Mark all answers on the Scantron card. The exam paper will NOT be marked for this section.

1. Suppose $f(2) = 8$ and $f(6) = 18$. The average rate of change for this function in the interval $x = 2$ and $x = 6$ is:

- a. 2.5
- b. 14.66
- c. 2 if $f(3) = 10$
- d. Cannot be determined.



2. Referring to the graph on the left, the limit at $x = 1$ is:

- a. -1
- b. 2
- c. 0.5
- d. Does not exist.

3. Referring to the graph on the left, the derivative at $x = 0$ is:

- a. $y = 0$
- b. 0
- c. -1
- d. Does not exist.

4. Referring to the graph above, the type of discontinuity at $x = -3$ is:

- a. a jump discontinuity.
- b. a removable discontinuity.
- c. an infinite discontinuity.
- d. none of the above.

5. $\lim_{x \rightarrow 5} \frac{x^2 - 25}{x - 5}$ is equal to:

- a. 5
- b. 10
- c. 25
- d. Cannot be determined.

6. Which of the following is not true for $y = x^2 + 3x - 1$?

- a. $\frac{dy}{dx} = \frac{d}{dx}(x^2) + \frac{d}{dx}(3x) + \frac{d}{dx}(-1)$
- b. $\frac{d^2y}{dx^2} = \frac{x}{e^{2x}} \frac{d}{dx}(e^{2x}) + \frac{d}{dx}(3x) + \frac{d^{10}}{dx^{10}}(99)$
- c. The tangent at $x = 2$ is 7.
- d. All of the above is true.

7. The derivative of $f(x) = \frac{3x^2 + 2\sqrt{x}}{x}$ is equal to:

- a. $3 + x^{-\frac{3}{2}}$
- b. $3 - x^{-\frac{3}{2}}$
- c. $3x + x^{-\frac{3}{2}}$
- d. none of the above.

8. If $s(t)$ is the position function of a particle, $\frac{ds}{dt} < 0$ and $\frac{d^2s}{dt^2} > 0$, then we can conclude:

- a. The particle is moving in the positive direction, and velocity is increasing.
- b. The particle is moving in the positive direction, and velocity is decreasing.
- c. The particle is moving in the negative direction, and velocity is increasing.
- d. The particle is moving in the negative direction, and velocity is decreasing.