

Differential Calculus Test 1A



Name: _____

7 8 9 10 11 12



Navigator



Assessment



Student



25 min

Question: 1

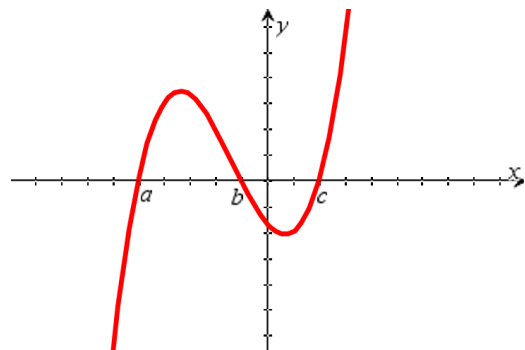
The function $f(x) = x^2 + 6x + 5$ has a tangent at $x = -2$. The equation to the tangent is:

- a) $y = 2x - 7$ b) $y = 2x$ c) $y = 2x + 1$ d) $y = -2x - 1$ e) $y = -2x + 1$

Question: 2

For the cubic equation shown below, which one of the following statements is true:

- a) $f'\left(\frac{a+b}{2}\right) = 0$
b) $f'(x) < 0$ for $x < a$
c) $f'(x) < 0$ for $b < x < c$
d) $f'(x) > 0$ for $x > c$
e) All of the above



Question: 3

If $f(x) = x^3 + 6x^2 + ax + 7$ has no turning points then:

- a) $a = 12$ b) $a > 12$ c) $a < 12$ d) $a = 0$ e) $a < 0$

Question: 4

If the tangent to $g(x) = \ln(x)$ at the point where $x = a$ passes through the origin, then a equals:

- a) 0 b) 1 c) 2.7 d) e e) π

Question: 5

If $f(x) = \sqrt{g(x)}$, $g(4) = 9$ and $g'(4) = 6$ then $f'(4)$ is equal to:

- a) 1 b) 2 c) 3 d) $\sqrt{6}$ e) $3\sqrt{6}$

Question: 6

If $f(x) = \frac{g(x)}{x}$ and $g(2) = 4$ and $g'(2) = 6$ then $f'(2)$ is equal to:

- a) 1.5 b) 2 c) 3 d) 6 e) 8

Question: 7

Given the function: $f(x) = \frac{\sin(x)}{x}$, then at $x = 0$ there is a:

- a) Local maximum
- b) Local minimum
- c) Stationary point of inflection
- d) Asymptote
- e) Point of discontinuity

Question: 8

Given the function: $f(x) = \begin{cases} \sin(x) & x \geq 0 \\ 0 & x < 0 \end{cases}$, which of the following is true?

- a) The function is not continuous at $x = 0$ but is differentiable at $x = 0$
- b) The function is not continuous at $x = 0$ and not differentiable at $x = 0$
- c) The $\lim_{x \rightarrow 0} f(x)$ exists so the function is differentiable at $x = 0$
- d) The function is continuous at $x = 0$ and differentiable at $x = 0$
- e) The function is continuous at $x = 0$ but not differentiable at $x = 0$

Question: 9

The average rate of change of the function $f(x) = x \cos(x)$ over the interval $\left[\frac{\pi}{3}, \frac{\pi}{6}\right]$ is equal to:

- a) $\frac{1}{2}(2 - \sqrt{3})$
- b) $\frac{\pi}{12}(\sqrt{3} - 2)$
- c) $\frac{\sqrt{2}}{8}(4 - \pi)$
- d) 0.5330
- e) 0.2791

Question: 10

The hypotenuse of a right angled isosceles triangle is increasing at a rate of $2\sqrt{2}$ cm/min. When the hypotenuse is equal to $6\sqrt{2}$, the rate of increase of the area of the triangle, in cm^2/min is:

- a) 24
- b) 12
- c) 6
- d) $12\sqrt{2}$
- e) $6\sqrt{2}$