Multiple choice questions - Differentiation

Year: Year 12 · 10

Question 1 $\frac{d}{dx}(x^5) =$

- ◯ **A.** x^4
- ◯ **B.** $5x^4$
- ◯ **C.** $5x^5$
- ◯ **D.** $4x^5$

Question 2 $\frac{d}{dx}(3x^2 - 4x + 1) =$

- ◯ **A.** $6x - 4$
- ◯ **B.** $6x + 1$
- ◯ **C.** $3x - 4$
- ◯ **D.** $6x^2 - 4$

Question 3 The gradient of $y = x^2$ at $x = 3$ is

- ◯ **A.** 3
- ◯ **B.** 6
- ◯ **C.** 9
- ◯ **D.** 2

Question 4 A stationary point has

- ◯ **A.** $y = 0$
- ◯ **B.** $\frac{dy}{dx} = 0$
- ◯ **C.** $\frac{d^2y}{dx^2} = 0$ only
- ◯ **D.** $x = 0$

Question 5 If $\frac{d^2y}{dx^2}$ at a stationary point it is a

- ◯ **A.** minimum
- ◯ **B.** maximum
- ◯ **C.** point of inflection only
- ◯ **D.** tangent

Question 6 The normal gradient when the tangent gradient is 4 is

- ◯ **A.** 4
- ◯ **B.** -4
- ◯ **C.** $\frac{1}{4}$
- ◯ **D.** $-\frac{1}{4}$

Question 7 $\frac{d}{dx}\left(\frac{1}{x}\right) =$

- ◯ **A.** $\frac{1}{x^2}$
- ◯ **B.** $-\frac{1}{x^2}$
- ◯ **C.** $\ln x$
- ◯ **D.** $-x$

Question 8 f is increasing where

- ◯ **A.** $f'(x) > 0$
- ◯ **B.** $f'(x)$
- ◯ **C.** $f(x) > 0$
- ◯ **D.** $f''(x) > 0$

Question 9 $\frac{d}{dx}\sqrt{x} =$

- ◯ **A.** $\frac{1}{2\sqrt{x}}$
- ◯ **B.** $2\sqrt{x}$
- ◯ **C.** $\sqrt{x}$
- ◯ **D.** $\frac{1}{2}x^{1/2}$

Question 10 The derivative of a constant is

- ◯ **A.** 1
- ◯ **B.** 0
- ◯ **C.** the constant
- ◯ **D.** undefined

Answer grid - Differentiation

Year: Year 12

Question	Answer	Explanation
1	**B**	Bring the power down.
2	**A**	Term by term.
3	**B**	$2x = 6$.
4	**B**	Gradient zero.
5	**B**	Concave down.
6	**D**	Negative reciprocal.
7	**B**	$x^{-1} \to -x^{-2}$.
8	**A**	Positive gradient.
9	**A**	$\frac{1}{2}x^{-1/2}$.
10	**B**	No change.