

DIFFERENTIATION

AS Unit 1: Pure Mathematics A

WJEC past paper questions: 2010 – 2017

Total marks available 100 (approximately 2 hours)

1. a) Given that $y = 3x^2 - 7x - 5$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Given that $y = ax^{\frac{5}{2}}$ and $\frac{dy}{dx} = -2$ when $x = 4$, find the value of the constant a . (3)
 (January 10)
2. a) Given that $y = -x^2 + 5x - 9$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Given that $y = \frac{3}{4}x^{\frac{1}{3}} + \frac{12}{x^2}$, find the value of $\frac{dy}{dx}$ when $x = 8$. (4)
 (Summer 10)
3. a) Given that $y = 6x^2 + 4x - 9$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Differentiate $\frac{3}{x^4} - 7x^{\frac{1}{3}}$ with respect to x . (2)
 (January 11)
4. a) Given that $y = 7x^2 - 5x + 2$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Differentiate $4x^{\frac{2}{5}} - \frac{9}{x} - 6$ with respect to x . (2)
 (Summer 11)
5. a) Given that $y = 8x^2 - 5x - 6$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Given that $y = \frac{a}{x} + 10\sqrt{x}$ and that $\frac{dy}{dx} = 3$ when $x = 4$, find the value of the constant a . (4)
 (January 12)
6. a) Given that $y = 3x^2 - 7x + 5$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Differentiate $\frac{2}{3}x^{\frac{1}{4}} + \frac{12}{x^3}$ with respect to x . (2)
 (Summer 12)

7. a) Given that $y = -x^2 + 4x - 6$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Differentiate $5x^{\frac{4}{3}} - \frac{9}{\sqrt{x}}$ with respect to x . (2)
 (January 13)
8. a) Given that $y = 5x^2 + 8x - 11$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Differentiate $6x^{\frac{2}{3}} + \frac{5}{x^2} - 4$ with respect to x . (2)
 (Summer 13)
9. a) Given that $y = 7x^2 - 6x - 3$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Given that $y = ax^{\frac{4}{3}} + 24x^{\frac{1}{2}}$ and that $\frac{dy}{dx} = \frac{11}{2}$ when $x = 64$, find the value of the constant a . (4)
 (January 14)
10. a) Given that $y = -3x^2 + 8x - 7$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Differentiate $9x^{\frac{5}{4}} - \frac{8}{\sqrt[3]{x}}$ with respect to x . (2)
 (Summer 14)
11. a) Given that $y = 9x^2 - 8x - 3$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Differentiate $\frac{3}{x^6} - 4x^{\frac{5}{3}}$ with respect to x . (2)
 (Summer 15)
12. a) Given that $y = 10x^2 - 7x - 13$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Given that $y = 4\sqrt{x} + \frac{45}{x}$, find the value of $\frac{dy}{dx}$ when $x = 9$. (4)
 (Summer 16)
13. a) Given that $y = -5x^2 - 7x + 13$, find $\frac{dy}{dx}$ from first principles. (5)
 b) Differentiate $6x^{\frac{3}{4}} + \frac{5}{x^3} - 9$ with respect to x . (2)
 (Summer 17)