CALCULUS AND ALGEBRA   After school session – Rouze

CHAIN RULE Is your problem Calculus? Or Algebra?

1. a) Find $f'(x)$ when $f(x) = \dfrac{1}{\sqrt{x^2 - 8x}}$ b) Find $f'(x)$ when $f(x) = \dfrac{1}{\sqrt{x^2 - 6x}}$

2. a) Find $f'(x)$ when $f(x) = 8(3 + 2x^2)^{1/2}$ b) Find $f'(x)$ when $f(x) = 3(11 - 7x^3)^{1/2}$

3. a)   Find $f'(x)$ when $f(x) = \cos 5x - \cos^5 x$ b) Find $f'(x)$ when $f(x) = 5\cos 4x - 4\sin 5x$

Find the derivative of each function. Simplify completely!

4. $y = \dfrac{x}{\sqrt{x^2 + 3}}$ 5. $f(x) = 2\sqrt{x} \cos \sqrt{x}$

6. $f(x) = x\sqrt{2x - 3}$ 7. $y = x\sqrt{1 - x}$

8. $y = (6x + 1)^7 (2x - 3)^3$ 9. $f(s) = (s^2 - 1)^{\frac{5}{2}} (s^3 + 5)$

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Answers:

1. a) $f'(x) = \dfrac{4 - x}{\left(x^2 - 8x\right)^{3/2}}$ b) $f'(x) = \dfrac{3 - x}{\left(x^2 - 6x\right)^{3/2}}$ 2. a) $f'(x) = \dfrac{16x}{\sqrt{3 + 2x^2}}$

b) $f'(x) = \dfrac{-63x^2}{2\sqrt{11 - 7x^3}}$ 3. a) $f'(x) = -5\sin 5x + 5\cos^4 x \sin x$ b) $f'(x) = -20\sin 4x - 20\cos 5x$

4. $y' = \dfrac{3}{\left(x^2 + 3\right)^{3/2}}$ 5. $f'(x) = \dfrac{\cos\sqrt{x} - \sqrt{x}\sin\sqrt{x}}{\sqrt{x}}$ 6. $f'(x) = \dfrac{3x - 3}{\sqrt{2x - 3}}$ 7. $y' = \dfrac{3x - 2}{2\sqrt{1 - x}}$

8. $y' = 120(x - 1)(2x - 3)^2 (6x + 1)^6$ 9. $f'(s) = 2s(4s^3 + 11)(s^2 - 1)^{3/2}$