Answer key

The method: The power rule

d/dx $x^n = nx^{n-1}$. Write roots and fractions as powers first. The derivative of a constant is 0.

$f(x) = \frac{7}{x^3}$ $f'(x) = \frac{-21}{x^4}$

write it as $7x^{-3}$

derivative $-21x^{-4}$ the power rule works for negative powers

$f'(x) = \frac{-21}{x^4}$

$f(x) = -x^5 + 3x^4 + 7x^3 + 7x^2 + 8x + 9$ $f'(x) = -5x^4 + 12x^3 + 21x^2 + 14x + 8$

bring each power down and lower it by 1; a constant gives 0 d/dx $x^n = nx^{n-1}$

$f'(x) = -5x^4 + 12x^3 + 21x^2 + 14x + 8$

$f(x) = 4\sqrt{x}$ $f'(x) = \frac{2}{\sqrt{x}}$

write $\sqrt{x}$ as $x^{\frac{1}{2}}$ then use the power rule

$f'(x) = 4 \cdot \frac{1}{2}x^{-\frac{1}{2}} = \frac{2}{\sqrt{x}}$

Problems 1 and 2 worked out · Version 0A

$f(x) = \frac{-9}{x^3}$ $f'(x) = \frac{27}{x^4}$

write it as $-9x^{-3}$

derivative $27x^{-4}$ the power rule works for negative powers

$f'(x) = \frac{27}{x^4}$

$f(x) = \frac{-4}{x^4}$ $f'(x) = \frac{16}{x^5}$

write it as $-4x^{-4}$

derivative $16x^{-5}$ the power rule works for negative powers

$f'(x) = \frac{16}{x^5}$

The power rule · Version 0A

1) $\frac{27}{x^4}$ 2) $\frac{16}{x^5}$ 3) $-20x^3 - 9x^2 - 16x + 4$ 4) $\frac{1}{2\sqrt{x}}$

Answer key

5) $-8x^3 + 12x^2 - 8x + 9$ 6) $\frac{3}{2\sqrt{x}}$ 7) $\frac{8}{x^2}$ 8) $\frac{-8}{x^2}$

9) $-20x^3 - 27x^2 - 6x - 9$ 10) $\frac{4}{\sqrt{x}}$ 11) $\frac{7}{x^2}$ 12) $\frac{4}{\sqrt{x}}$