

CHAPTER 2: DERIVATIVES

Test 3 Solutions

Part A: Knowledge and Understanding

1a) false

1b) true

1c) true

1d) true

1e) false

2) $f(x) = x^9 \quad a = 1$

3) $h'(x) = p'(x)q(x)r(x)s(x) + p(x)q'(x)r(x)s(x) + p(x)q(x)r'(x)s(x) + p(x)q(x)r(x)s'(x)$

4) $(3x + 1)^3(x^3 - x + 1)^4(57x^3 + 15x^2 - 27x + 7)$

5) $f'(x) = \frac{[6x(1-2x^3) + 3x^2(-6x^2)](1+x)^3 - [3x^2(1-2x^3)]3(1+x)^2}{(1+x)^6}$

6) $\frac{dy}{dx} = 0$

Part B: Application

1) $x = 3$ or -7

2) $y = 60x - 236$

3) 4 m/s

4) 208

Part C: Thinking

1) $(12x^2)f(3x^2 - 2x + 1) + (4x^3)(6x - 2)f'(3x^2 - 2x + 1)$

2) $a = 2 \quad b = -2 \quad c = -40$

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3) *see video solutions*

Part D: Communication

1) *always true*

2) *vertical asymptote, vertical tangent, cusp, corner, etc*

3) *When you have a composite function. If $f(x) = g(h(x))$, then $f'(x) = g'(h(x)) * h'(x)$*

4) *product rule or expand and differentiate each term using power rule.*