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2

$$f(x) = \sqrt{30}$$

$$f'(x) = 0 \text{ (derivative of constant function)}$$

6

$$g(x) = 5x^8 - 2x^5 + 6$$

$$g'(x) = 5 \cdot 8x^7 - 2 \cdot 5x^4 + 0$$

$$= 40x^7 - 10x^4$$

20

$$u(t) = 3\sqrt{t^2} + 2\sqrt{t^3}$$

$$= t^{2/3} + 2t^{3/2}$$

$$u'(t) = \frac{2}{3} t^{2/3-1} + 2 \cdot \frac{3}{2} t^{3/2-1}$$

$$= \frac{2}{3} t^{-1/3} + 3 t^{1/2}$$

$$= \frac{2}{3\sqrt[3]{t}} + 3\sqrt{t} \quad \#$$

23

$$V(x) = (2x^3 + 3)(x^4 - 2x)$$

$$v'(x) = (2x^3 + 3)(4x^3 - 2) + 6x^2(x^4 - 2x)$$

$$= 8x^6 - 4x^3 + \cancel{12x^3} - 6 + 6x^6 - \cancel{12x^3}$$

$$= \cancel{14x^6} - \cancel{16x^3} + \cancel{12x^3} - 6$$

$$= 14x^6 - 4x^3 + 6. \underline{\underline{\#}}$$

24. $Y(u) = (u^{-2} + u^{-3})(u^5 - 2u^2)$

$$Y'(u) = (-2u^{-3} - 3u^{-4})(u^5 - 2u^2)$$

$$+ (u^{-2} + u^{-3})(5u^4 - 4u)$$

$$= -2u^2 + \cancel{4u^1} - 3u + 6u^{-2}$$

$$+ 5u^2 - \cancel{4u^1} + 5u - 4u^{-2}$$

$$= 3u^2 + 2u + 2u^{-2}$$

$$= 3u^2 + 2u + \frac{2}{u^2} \underline{\underline{\#}}$$