

$$\textcircled{1} y = (3x^2 + 5x - 3)^7$$

$$y' = 7(3x^2 + 5x - 3)^6 (6x + 5)$$

$$y' = (42x + 35)(3x^2 + 5x - 3)^6$$

$$\textcircled{2} y = (2x^2 + 5x)(3x^2 + 7)$$

$$y' = (4x + 5)(3x^2 + 7) + (2x^2 + 5x)(6x)$$

$$y' = 12x^3 + 28x + 15x^2 + 35 + 12x^3 + 30x^2$$

$$y' = 24x^3 + 45x^2 + 28x + 35$$

$$\textcircled{3} y = \frac{3x + 4}{2x - 5}$$

$$y' = \frac{(2x - 5)3 - (3x + 4)2}{(2x - 5)^2}$$

$$y' = \frac{6x - 15 - 6x - 8}{(2x - 5)^2}$$

$$y' = \frac{-23}{(2x - 5)^2}$$

$$\textcircled{4} y = \frac{4}{x^2} - \frac{6}{x} + 8$$

$$y = 4x^{-2} - 6x^{-1} + 8$$

$$y' = -8x^{-3} + 6x^{-2}$$

$$5. y = \left(\frac{2x}{3x-7}\right)^4$$

$$y' = 4 \left(\frac{2x}{3x-7}\right)^3 \cdot \left[ \frac{(3x-7)(2) - (2x)(3)}{(3x-7)^2} \right]$$

$$y' = 4 \left(\frac{2x}{3x-7}\right)^3 \cdot \frac{-14}{(3x-7)^2}$$

$$y' = -56 \cdot \frac{8x^3}{(3x-7)^5}$$

$$y' = \frac{-448x^3}{(3x-7)^5}$$

$$6. y = \sin(5x-3)$$

$$y' = \cos(5x-3) \cdot 5$$

$$y' = 5 \cos(5x-3)$$

$$7. y = \sec(3x^2+4)$$

$$y' = 6x \sec(3x^2+4) \tan(3x^2+4)$$

$$8. y = \tan^3(6x^2)$$

$$y' = 3 \tan^2(6x^2) \sec^2(6x^2) \cdot 12x$$

$$y' = 36x \tan^2(6x^2) \sec^2(6x^2)$$

$$9. y = \cos^4(3x^5)$$

$$y' = 4 \cos^3(3x^5) \cdot (-\sin(3x^5)) \cdot 15x^4$$

$$y' = -60x^4 \cos^3(3x^5) \sin(3x^5)$$

$$10. y = 2x^3 \cos(17x)$$

$$y' = 6x^2 \cos(17x) + 2x^3 (-\sin(17x) \cdot 17)$$

$$y' = 6x^2 \cos(17x) - 34x^3 \sin(17x)$$

$$11. \quad y = \frac{\csc(3x)}{x^2}$$

$$y' = \frac{x^2 \cdot \csc(3x) \cot(3x) \cdot 3 - \csc(3x) (2x)}{x^4}$$

$$y' = \frac{-3x^2 \csc(3x) \cot(3x) - 2x \csc(3x)}{x^4}$$

$$y' = \frac{-3x \csc(3x) \cot(3x) - 2 \csc(3x)}{x^3}$$

$$12. \quad y = (x^3 - 9)^4 (x^2 + 4)^5$$

$$y' = 4(x^3 - 9)^3 (3x^2)(x^2 + 4)^5 + (x^3 - 9)^4 \cdot 5(x^2 + 4)^4 (2x)$$

$$y' = 2x(x^3 - 9)^3 (x^2 + 4)^4 (6x(x^2 + 4) + 5(x^3 - 9))$$

$$y' = 2x(x^3 - 9)^3 (x^2 + 4)^4 (6x^3 + 24x + 5x^3 - 45)$$

$$y' = 2x(x^3 - 9)^3 (x^2 + 4)^4 (11x^3 + 24x - 45)$$

$$13. \quad y = 3x^3 - 2x + 4 \quad (2, 24)$$

$$y' = 9x^2 - 2$$

$$f'(2) = 9 \cdot 4 - 2$$

$$f'(2) = 34$$

$$\underline{y - 24 = 34(x - 2)}$$

tangent line

$$14. \quad y = \sqrt{3x + 4} \quad (7, 5)$$

$$y' = \frac{1}{2}(3x + 4)^{-\frac{1}{2}} \cdot 3$$

$$y'(7) = \frac{1}{2}(25)^{-\frac{1}{2}} \cdot 3$$

$$y'(7) = \frac{3}{10}$$

$$\underline{y - 5 = \frac{3}{10}(x - 7)}$$

tangent line

15. -16

64 initial velocity ft/sec

96 initial height in ft

$$b) \quad y' = -32t + 64$$

$$0 = -32t + 64$$

$$-64 = -32t$$

$$2 = t$$

after 2 sec.

$$c) \quad y(t) = -16(2)^2 + 64(2) + 96$$

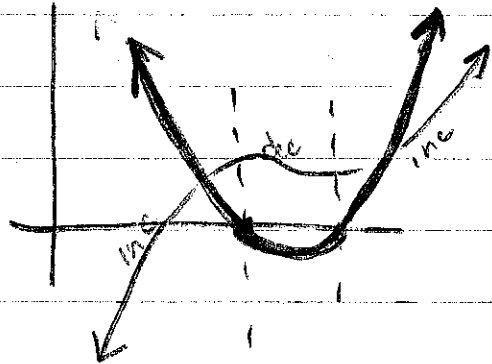
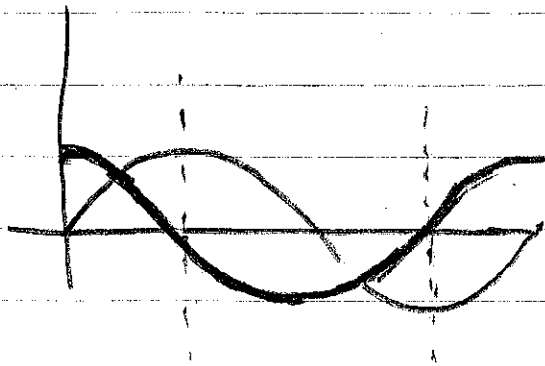
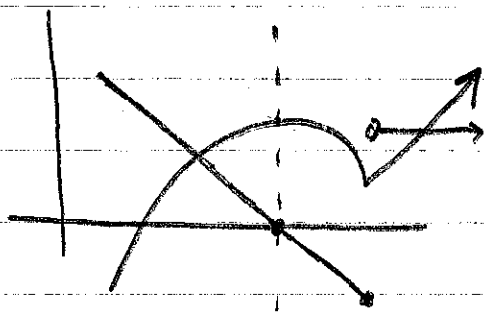
$$y(2) = 160 \text{ ft}$$

$$d) \quad 0 = -16t^2 + 64t + 96$$

zero function 5.16 sec

$$\Rightarrow y'(5.16) = -27.5(1.2) + 64 = -10.19 \text{ ft/sec}$$

16.



17.

