Answers 2.4 P 1/2

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

12.) $y' = \dfrac{-3}{2(5-3x)^{1/2}}$

14.) Tricky!

$y = \sqrt{x^2-2x+1} = \sqrt{((x-1)^2} = ((x-1)^2)^{1/2}$

But! $= |x-1|$

SO:

$y' = \dfrac{d}{dx}|x-1|$ or $\underbrace{y' = \dfrac{d}{dx}(x^2-2x+1)^{1/2}}$

$y' = \dfrac{x-1}{\pm(x-1)}$ ← definition of Abs. val.

$\therefore \boxed{y' = \begin{cases} 1 & \text{if } x \geq 1 \\ -1 & x < 1 \end{cases}}$

15.) $y' = \dfrac{1}{2x^{1/2}(1-x)^{3/2}}$

22.) $y' = \dfrac{-x}{(x^2-2)^{+3/2}}$ ← woops! positive

23.) $f'(x) = (x-3)^3(6x^2-4x)$

24.) $f'(x) = (3x-9)^2(12x-9)$

27.) $y' = \dfrac{1}{(x^2+1)^{3/2}}$

28) $y' = \dfrac{-x^4+4}{(x^4+4)^{3/2}}$

30) $h'(t) = \dfrac{-2t^6+8t^3}{(t^3+2)^2}$

32) $g'(x) = \dfrac{(3x^2-2)^2(18x^4+54x+12)}{(2x+3)^4}$

41) $y' = -3\sin 3x$

42) $y' = \pi\cos\pi x$

44) $h'(x) = 2\sin x(\cos x)$

47) $h' = 2(\cos^2 2x - \sin^2 2x)$

use double ∢ Identity! Required!!

$h' = 2\cos 4x$

52) Double angle trig ID

$g' = -10\pi(\cos\pi t)(\sin\pi t)$

$\therefore g' = -5\pi(\sin 2\pi t)$

53) Double ∢ trig ID

$f' = \frac{1}{2}\sin 4x$

59) $s'(t) = \dfrac{(t+1)}{(t^2+2t+8)^{1/2}}$

$s'(2) = 3/4$

61) $f' = \dfrac{-9x^2}{(x^3-4)^2}$; $f'(1) = \dfrac{-9}{25}$

62) $f' = \dfrac{-4x+6}{(x^2-3x)^3}$; $f'(4) = \dfrac{-5}{32}$

63) $f' = \dfrac{-5}{(t-1)^2}$

67) $f' = \dfrac{3x}{(3x^2-2)^{1/2}}$

tangent Line at $(3, 5)$
$y = 3x - \frac{2}{5}$

69) $y' = 2(2x^3+1)(6x^2)$ tangent Line at $(-1, 1)$ $y = -12x - 11$

71) $y' = 2\cos 2x$; tangent line at $(\pi, 0)$
$y = 2x - 2\pi$

83) $f' = 12x(x^2-1)^2$
$f'' = 60x^4 - 72x^2 + 12$

85) $f' = 2x\cos x^2$
$f'' = 2x^2 - 4x^2 \sin x^2$

84) $f'(x) = \dfrac{-1}{(x^2-2)^2}$
$f''(x) = \dfrac{2}{(x-2)^3}$

86)
$f' = \dfrac{-3}{(x-3)^4}$
$f'' = \dfrac{-12}{(x-3)^5}$