1. Let $f(x) = \frac{1}{x}$, then $f^{(50)}(-1) =$

(a) $-50!$ (correct)
(b) $49!$
(c) $51!$
(d) undefined
(e) $50!$

$f = x^{-1}$

$f^{(1)} = -x^{-2}$

$f^{(2)} = (-1)(-2)x^{-3}$ -sr

$f^{(50)} = (-1)(-2)(-3)\cdots(-50)x^{-51}$

$f^{(50)}(-1) = 50!(-1)^{-51} = -50!$

2. The point(s) on the curve $y = x^3 + 3x^2 - 3x + 3$ where the tangent is parallel to the line $3x + y = 15$ is (are):

(a) $(0, 3)$ and $(-2, 13)$ (correct)
(b) $(0, 3)$ only
(c) $(-2, 13)$ only
(d) $(0, 15)$ and $(-2, 21)$
(e) $(0, 15)$ only

Similar to #51/Sec 3.1

$y = -3x + 15$

$\Rightarrow m = -3$

$y' = 3x^2 + 6x - 3 = -3$

$\Rightarrow 3x^2 + 6x = 0$

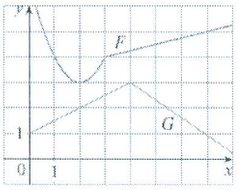
$3x(x + 2) = 0$

$x = 0$ or $x = -2$

$(0, 3)$ $(-2, 13)$

3. Let $P(x) = \dfrac{F(x)}{G(x)}$, where F and G are the function whose graphs are shown then $P'(2) =$

#50/sec#3.2



(a) $-\dfrac{3}{8}$ (correct)

(b) 0

(c) undefined

(d) $-\dfrac{3}{4}$

(e) $\dfrac{3}{2}$

$$P'(x) = \frac{F' \cdot G - G' \cdot F}{G^2}$$

$$P'(2) = \frac{F'(2)G(2) - G'(2)F(2)}{G^2(2)}$$

$$\frac{0 - \left(\frac{1}{2}\right)(3)}{4} \text{ (correct)}$$

$$= -3/8$$

4. Which one of the following statements is always **True**?

(a) $\dfrac{d}{dx}(\tan^2 x) = \dfrac{d}{dx}(\sec^2 x)$

(b) $\dfrac{d}{dx}(10^x) = x\,10^{x-1}$

(c) If f is differentiable, then $\dfrac{d}{dx} f(\sqrt{x}) = \dfrac{f'(x)}{2\sqrt{x}}$

(d) $\lim\limits_{x \to 0} (1+x)^{1/x} = 1$

(e) $\dfrac{d}{dx}|x^2| = 2|x|$

True, False Quiz
end of chapter #3