Ch 3 AB CALC Review

1. Let $f(x) = x^2 + \dfrac{2}{x^2}$, then $f'(-2) =$

(A) $\frac{-9}{2}$ (B) 5 (C) $\frac{-7}{2}$ (D) -8 (E) none of these

2. $\lim_{h \to 0}\left[\dfrac{5(x+h)^2 - 5x^2}{h}\right]$ (fast!!)=

(A) 5x (B)10x (C) $5x^2$ (D)10x + 5h (E) none of these

3. If $y = \cos^2\frac{x}{2} - \sin^2\frac{x}{2}$,

then y' =

(A) 0 (B) cos x (C) sin x (D) $-4\sin\frac{x}{2}\cos\frac{x}{2}$ (E)-sin x

4. If $f(x) = 2\sin\frac{x}{2} + 8\cos\frac{x}{2}$, then $f'\left(\frac{\pi}{2}\right) =$

(A) $5\sqrt{2}$ (B) $-3\sqrt{2}$ (C) $\frac{-3\sqrt{2}}{2}$ (D) $3\sqrt{2}$ (E) $\frac{3}{\sqrt{2}}$

5. If $f(x) = (2x+1)^4$, then the 4th derivative of $f(x)$ at x = 0 is

(A) 0 (B) 24 (C) 48 (D) 240 (E) 384

6. If $y = \dfrac{3}{4+x^2}$, then $\dfrac{dy}{dx} =$

(A) $\frac{-6x}{\left(4+x^2\right)^2}$ (B) $\frac{3x}{\left(4+x^2\right)^2}$ (C) $\frac{6x}{\left(4+x^2\right)^2}$

(D) $\frac{-3}{\left(4+x^2\right)^2}$ (E) $\frac{3}{2x}$

7. if $f(x)=x$, then $f'(5)=$

(A) 0 (B) $\frac{1}{5}$ (C) 1 (D) 5 (E) $\frac{25}{2}$

8. The function defined by $f(x)=x^3-3x^2$ for all real numbers, x has a relative maximum at x =

(A) -2 (B) 0 (C) 1 (D) 2 (E) 4

9. If $\frac{dy}{dx}=\cos(2x)$, then y =

(A) $-\frac{1}{2}\cos(2x)+c$ (B) $-\frac{1}{2}\cos^2(2x)+c$ (C) $\frac{1}{2}\sin(2x)+c$

(D) $\frac{1}{2}\sin^2(2x)+c$ (E) $-\frac{1}{2}\cos(2x)+c$

Answers:

Multiple Choice :

1. c 2. b 3. e 4. c 5. e 6. a 7. c 8. b 9. c

Free Response:

1. a) t = 5 ; b) velocity = 50ft/sec, speed = 50ft/sec, acceleration = 0ft/ s^2; c) 0 < t < 4
d) (5, 6)

2. a) 8x-4 b) $4x\cos(2x^2+1)$; c) $\frac{5}{2}+\frac{3}{x^2}-\frac{8}{x^3}$

3. a) v = $-6t^2+12t$; b) a = -12t +12; c) -4; d) -18; e) 18; f) -24; g) speeding up; h) left

4. a) $-10x^{-2}$; b) y = $-10x^{-2}+c$; c) y = $-10x^{-2}+11$

5. $y-5=\frac{-1}{12}(x-1)$

6. check with other students