PRINTABLE VERSION

Quiz 6

Question 1

Given $f(x) = \dfrac{7}{\sqrt{x+2}}$ which of the following expressions will represent $f'(x)$?

a) $\lim\limits_{h \to 0} \dfrac{\dfrac{7}{\sqrt{x+h+2}}}{h}$

b) $\lim\limits_{h \to x} \dfrac{\left(\dfrac{7}{\sqrt{x+h+2}}\right) - \left(\dfrac{7}{\sqrt{x+2}}\right)}{h}$

c) $\dfrac{\left(\dfrac{7}{\sqrt{x+h+2}}\right) - \left(\dfrac{7}{\sqrt{x+2}}\right)}{h}$

d) $\lim\limits_{h \to 0} \dfrac{\left(\dfrac{7}{\sqrt{x+h+2}}\right) - \left(\dfrac{7}{\sqrt{x+2}}\right)}{h}$

e) $\lim\limits_{h \to 0} \dfrac{\left(\dfrac{7}{\sqrt{x+2}} + h\right) - \left(\dfrac{7}{\sqrt{x+2}}\right)}{h}$

Question 2

$\lim_{h \to 0} \frac{\frac{1}{6+h} - \frac{1}{6}}{h} =$

a) does not exist

b) $\frac{1}{6}$

c) $-\frac{1}{36}$

d) 0

e) $-\frac{1}{6}$

Question 3

The limit $\lim_{h \to 0} \frac{(2+h)^2 - 4}{h}$ represents the derivative of a function f at a number c. Determine f and c.

a) $f(x) = (2+x)^2, c = -2$

b) $f(x) = x^2, c = 2$

c) $f(x) = (2+x)^2, c = 2$

d) $f(x) = (2-x)^2, c = 4$

e) $f(x) = x^2, c = 4$

Question 4

The limit $\lim_{h \to 0} \dfrac{\cos\left(\dfrac{\pi}{6} + h\right) - \dfrac{\sqrt{3}}{2}}{h}$ represents the derivative of a function f at a number c. Determine f and c.

a) $f(x) = \cos(1/6\,\pi\,x)$, $c = \dfrac{\sqrt{3}}{2}$

b) $f(x) = \cos(x)$, $c = \dfrac{\pi}{6}$

c) $f(x) = -\cos(x)$, $c = \dfrac{\sqrt{3}}{2}$

d) $f(x) = \cos(1/6\,\pi\,x)$, $c = \dfrac{\pi}{6}$

e) $f(x) = \cos(x)$, $c = \dfrac{\sqrt{3}}{2}$

Question 5

Given that $f(x) = 6\,x^2 - 2\,x$ and $c = 4$, find $f'(c)$ by forming the difference quotient, $\dfrac{f(c+h) - f(c)}{h}$, and taking the limit as $h \to 0$

a) 88

b) 12

c) 46

d) -2

e) 0

Question 6

Given that $f(x) = -2x^2 - 3x$, find $f'(x)$ by forming the difference quotient, $\dfrac{f(x+h) - f(x)}{h}$, and taking the limit as $h \to 0$

a) 0

b) $f'(x)$ does not exist.

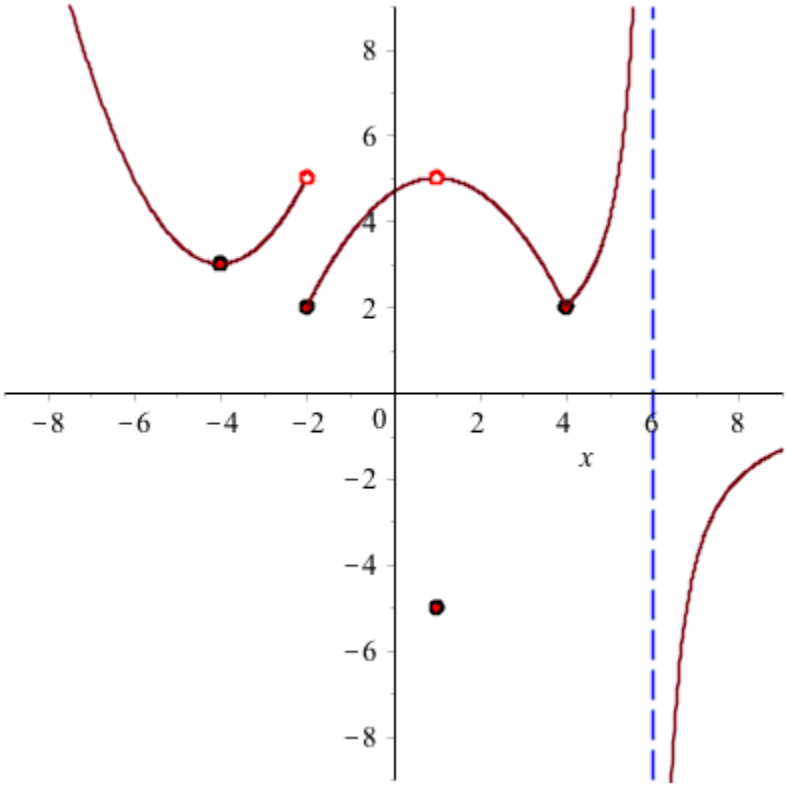
c) $-4x - 3$

d) $4x + 3$

e) $4x - 3$

Question 7

The graph of a function f is shown in the figure.



At which numbers c is f continuous but not differentiable?

a) Every where differentiable

b) At $c = -4$, c = -2, c = 1 and c = 7

c) At $c = 4$

d) At $c = 1$

e) At $c = -4$

Question 8

Given that

$$f(x) = \begin{cases} 2x & x < -1 \\ -x^2 - 1 & x \geq -1 \end{cases}$$

and c = -1, find $f'(c)$, if it exists.

a) 3

b) -1

c) 2

d) 1

e) $f'(-1)$ does not exist

Question 9

Determine the values of the constants B and C so that the function given below is differentiable.

$$f(x) = \begin{cases} 9x^2 & x \leq 1 \\ Bx + C & x > 1 \end{cases}$$

a) $\{B = -18, C = 27\}$

b) $\{B = 18, C = -9\}$

c) $\{B = -36, C = -9\}$

d) $\{B = 18, C = 36\}$

e) $\{B = 18, C = 45\}$

Question 10

If $f(-4) = 2$ and $f'(-4) = -6$, find the equation of the tangent line to f at $x = -4$.

a) $y = -6x - 22$

b) $y = -6x + 2$

c) $y = 2x - 6$

d) $y = 2x + 2$

e) $y = -6x + 26$