MCV4U Practice for the Chapter 1 Quiz

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Determine the slope of the line through the points (8, 13) and (–2, 3).

a. 1
b. –1
c. $\sqrt{10}$
d. $-\sqrt{10}$

____ 2. Determine an expression, in simplified form, for the slope of the secant PQ with $P(1, 2)$ and $Q(1 + h,\ f(1+h))$ where $f(x) = 2x^2$.

a. $4+2h$
b. $4-2h$
c. $8-4h$
d. $8+4h$

____ 3. Determine an equation of the line tangent to the curve $y = \frac{1}{x+3}$ at the point with x-coordinate 2.

a. $-7x + 25y + 1 = 0$
b. $7x - 25y + 1 = 0$
c. $-x - 25y - 7 = 0$
d. $x + 25y - 7 = 0$

____ 4. An oil tank is being drained for cleaning. After t minutes there are V litres of oil left in the tank, where $V(t) = 40(20 - t)^2$, $0 \le t \le 20$. Determine the rate of change of volume at the time $t = 10$.

a. –800 litres/minute
b. –600 litres/minute
c. –400 litres/minute
d. –200 litres/minute

____ 5. What is the slope of the tangent to the graph of the position function?

a. instantaneous position
b. instantaneous acceleration
c. average velocity
d. instantaneous velocity

____ 6. Determine $\lim\limits_{x \to -3} \frac{2x^3 - 18x}{x+3}$.

a. 6
b. –6
c. 36
d. –36

____ 7. $d(x) = \begin{cases} -x - k, \text{ if } x \ne -1 \\ 2x + 2k, \text{ if } x = -1 \end{cases}$. Determine k so that $d(x)$ is continuous.

a. $k = 1$
b. $k = -1$
c. $k = 0$
d. $k = -4$

Short Answer

8. Rationalize the denominator of $\frac{\sqrt{10}}{3\sqrt{3} + \sqrt{15}}$.

9. Determine an equation of the line tangent to the curve $y = \sqrt{5x-4}$ at the point with x-coordinate 4.

10. Describe what can be inferred about the line tangent to a curve if the slope at a point is found to be 0.

11. Determine the average velocity of the function $f(t) = \sqrt{t-2}$ between the time intervals $t = 3$ and $t = 5$.

12. Does the value of a function at a point have to exist in order for the limit to exist at that point? Explain.

13. Does $\lim\limits_{x \to 3} \begin{cases} 5, \text{ if } x = 3 \\ 2, \text{ if } x \neq 3 \end{cases}$ exist? Explain.

14. Determine $\lim\limits_{x \to 3} \dfrac{3x-8}{4x-12}$, if it exists.

15. Determine $\lim\limits_{x \to -9} \dfrac{5x^3 + 40x^2 - 45x}{x+9}$.

16. Explain how to determine $\lim\limits_{x \to 3} \dfrac{2x-6}{x^2-9}$.

17. $j(x) = \begin{cases} x-2, \text{ if } x \neq -2 \\ 3kx+5, \text{ if } x = -2 \end{cases}$. Determine k so that $j(x)$ is continuous.

18. Determine the values of x for which the function $f(x) = \dfrac{\sqrt{3x-6}}{x-5}$ is continuous.