| Course's Name :Calculus 1 | Palestine Technical University - Kadoorie | Instructor's Name : |
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| Course's Number :15010101 | | Student'sName: ............................... |
| Exam's Period : 1 hour | | Student'sNumber: ............................... |
| Questions' Number : 4 | First Exam | Section'sNumber: ............................... |
| Total Mark : 60 | Second Semester 2016/2017 | Exam's Date :6 / 3 / 2017 |
| Pages' Number : 4 | | Form : A |

**Q1 )  20 pts  ( 2 pts each )**

**Choose the correct answer :**

1) The value of $(k)$ for which the line $kx + 2y = 4$ is perpendicular to the line $2x + y = 1$ is :

a) $\dfrac{1}{2}$

b)  1

c)  $-1$

d)  $-2$

2) Which of the following functions is not even  :

a) $f(x) = x^2$

b) $f(x) = \sec x$

c) $f(x) = x^2 - x$

d) $f(x) = |x|$

3) If $f(x) = \lfloor x \rfloor$ and $g(x) = \lceil x \rceil$ , then $\dfrac{f}{g}(-2.3) =$

a) $\dfrac{3}{2}$

b) $-\dfrac{3}{2}$

c) $\dfrac{2}{3}$

d) $-\dfrac{2}{3}$

4) If $f(x) = x^3 + 3x^2 + 4x + 10$ and $g(x) = 5$, then $g \circ f(x) =$

a) $5x^2 + 15x + 25$

b)  5

c) 1125

d) $5x^3 + 15x^2 + 20x + 50$

5) If $\lim\limits_{x \to 3} \dfrac{f(x)}{x-3} = 7$ , then $\lim\limits_{x \to 3} f(x) =$

a) 7

b) 0

c) 21

d)  DNE

6) $\lim\limits_{x \to 0} \dfrac{|x|}{x}$

    a) 1                        b) -1

    c) 0                        d) DNE

7) If $\sqrt{5 - x^2} \le f(x) \le \sqrt{5} - x$ , for $x \in [-1,1]$ , then $\lim\limits_{x \to 0} f(x) =$

    a) 5                        b) $\sqrt{5}$

    c) $\sqrt{5} - 1$               d) 2

8) $\lim\limits_{x \to \frac{\pi}{2}} \dfrac{\sin 2x}{3x} =$

    a) $\dfrac{2}{3}$                     b) $\dfrac{3}{2}$

    c) 0                        d) DNE

9) If $f(x) = \begin{cases} \dfrac{x^2 - 9}{x + 3} & x \ne -3 \\ c & x = -3 \end{cases}$

If $f(x)$ is continuous for all $x \in R$, then $c =$

    a) 3                        b) 6

    c) 0                        d) -6

10) If $y = 7$ is a horizontal asymptote of a rational function $f(x)$, then which of the following must be true :

    a) $\lim\limits_{x \to 7} f(x) = \infty$            b) $\lim\limits_{x \to \infty} f(x) = 7$

    c) $\lim\limits_{x \to 0} f(x) = 7$             d) $\lim\limits_{x \to 7} f(x) = 0$

**Q2 )  13 pts**

If $f(x) = x^2$, and $g(x) = \sqrt{1-x}$, then answer the following questions :

a)  Find domain $\dfrac{g}{f}(x)$   ( 5 pts )

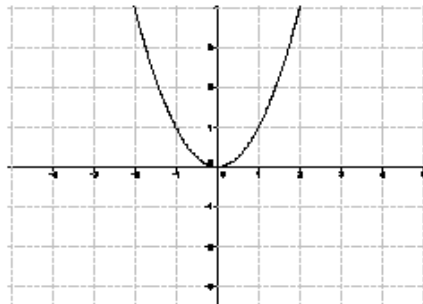b)  Find $f \circ g(x)$     ( 2 pts )

c)  Find domain of $f \circ g(x)$     ( 3 pts )

d)  Use the graph of $f$ to graph the following functions   ( 3 pts )

1)  $h(x) = -x^2$

2)  $k(x) = (x+2)^2$

3)  $l(x) = x^2 + 3$



**Q3 )  15 pts**

a)  Find the following limits :

1)  $\displaystyle\lim_{x \to 0} \dfrac{\sqrt{3+x} - \sqrt{3}}{x}$          ( 5 pts)

3

2) $\displaystyle\lim_{x\to 0} \frac{1-\cos x}{x}$        ( 5 pts)

**b)** Solve the inequality   $\dfrac{1}{x^2} < 100$      ( 5 pts )

**Q4 ) 12 pts**

Find all the asymptotes ( if exist ) for $f(x) = \dfrac{x^2 - x - 2}{x^2 - 5x + 6}$

*Good luck*