King Abdulaziz University		**Second Exam – Math110**
Faculty of Science and Arts – Rabigh		**Date: 29 /6 / 1437**
Department of Mathematics		**Time: 90 minutes**

Name: …….. **ID:** …… **A**

Choose the correct answer of the following questions:

(1) $\lim\limits_{x\to\infty} \dfrac{\sqrt{x^2+1}}{x-4} =$

(A) ∞ (B) 0 (C) 1 (D) -1

(2) The solution of the equation $2^{x-5}=7$ is

(A) $\ln 7$ (B) $\dfrac{\ln 7}{\ln 2}$ (C) $-\ln 5$ (D) $\dfrac{\ln 7}{\ln 2}+5$

(3) The domain of the function $f(x)=e^x$ is

A) R (B) $(1,\infty)$ (C) $(0,\infty)$ (D) $(-\infty,0)$

(4) The vertical asymptotes of $f(x)=\dfrac{x-1}{x^2+2x-3}$ are:

(A) $x=-3$ (B) $x=-3,\ x=1$ (C) $y=-3$ (D) $y=-3,\ y=1$

(5) The solution of the equation $5\ln x=3$ is

(A) $\dfrac{1}{\sqrt{e}}$ (B) $e^{-\frac{1}{3}}$ (C) $e^{\frac{3}{5}}$ (D) $\sqrt{e}$

(6) $\tan(\arctan(5)) =$

(A) $\dfrac{1}{5}$ (B) $\dfrac{1}{10}$ (C) 10 (D) 5

(7) $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) =$

(A) $\frac{\pi}{3}$ (B) $-\frac{\pi}{3}$ (C) $-\frac{\pi}{6}$ (D) $\frac{\pi}{6}$

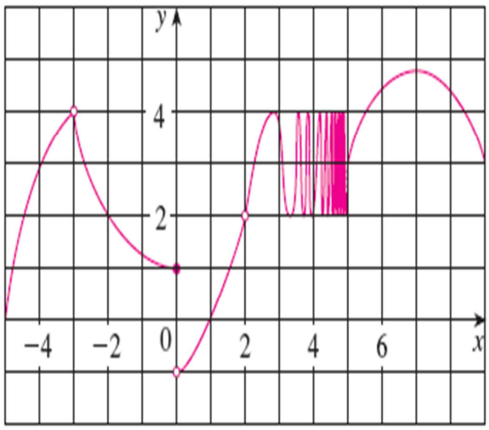
(8) $\lim_{x\to 0} \quad x^2 \sin\frac{1}{x} =$

(A) -1 (B) 0 (C) 1 (D) does not exist

(9) $g(x) = \begin{cases} 2x+1 & if \quad x \le 2 \\ x^2+1 & if \quad x > 2 \end{cases}$, then $\lim_{x\to 2} \quad g(x) =$

(A) 3 (B) 5 (C) -3 (D) does not exist

(10) From the figure shown: $\lim_{x\to 0} \quad f(x) =$



(A) 1 (B) -1

(C) 0 (D) does not exist

(11) From the figure shown: $f(2) = 2$

(A) True (B) False

(12) From the figure shown: $\lim_{x\to -3} \quad f(x) =$

(A) 0 (B) 4

(C) 2 (D) does not exist

(13) If f is a one-to-one function such that $f(3) = -1$, then $f^{-1}(-1)$ is

(A) 9 (B) 3 (C) 2 (D) does not exists

(14) The range of the function $f(x) = e^x$ is

A) R (B) $(1,\infty)$ (C) $(0,\infty)$ (D) $(-\infty,0)$

(15) The inverse function of the function $f(x)=e^{x}$ is

(A) e^{-x} (B) - e^{-x} (C) e^{-1} (D) $\ln x$

(16) $\lim_{x\to 5} f(x)=7$, then $\lim_{x\to 5^{-}} f(x)=$

(A) 5 (B) 7 (C) -5 (D) -7

(17) $\lim_{h\to 0} \dfrac{(h+4)^2-16}{h}=$

(A) 6 (B) 8 C) -4 (D) -10

(18) If $4x-9\le f(x)\le x^2-4x+7$, then $\lim_{x\to 4} f(x)=$

(A) 3 (B) 2 (C) -2 (D) 7

(19) The following function is continuous at the given point:

$$f(x)=\begin{cases}\dfrac{x^2-4}{x-2} & if\ x\neq 2\\ 1 & if\ x=2\end{cases} \quad \text{at } x=2$$

(A) True (B) False

(20) $\lim_{x\to 0} \dfrac{\sqrt{1+x}-1}{x}$

(A) 0 (B) $\frac{3}{2}$ (C) $\frac{-3}{2}$ (D) $\frac{1}{2}$

(21) $\lim_{x\to 1} \dfrac{x^3-1}{x^2+1}=$

(A) Does not exist (B) $\frac{3}{2}$ (C) 0 (D) $\frac{1}{2}$

(22) The domain of the function $f(x)=\ln x$ is

A) R (B) $(0,\infty)$ (C) $(1,\infty)$ (D) $(-\infty,0)$

(23) $\lim_{x\to -1} \dfrac{x^2-2x-3}{x^2-1} =$

(A) Does not exist (B) 2 (C) -2 (D) $\frac{1}{2}$

(24) A function $f(x)$ is continuous at $x=a$ if $\lim_{x\to a} f(x) = f(a)$

(A) True (B) False

(25) The range of the function $f(x) = \ln x$ is

A) R (B) $(0,\infty)$ (C) $(1,\infty)$ (D) $(-\infty,0)$

(26) $\log_2 100 = 2\log_2 10$

(A) True (B) False

(27) $\lim_{x\to\infty} \sqrt{x^2-1} - x =$

(A) $3x$ (B) $\sqrt{x^2-1}$ (C) 0 (D) ∞

(28) The horizontal asymptote of $f(x) = \dfrac{x}{x+4}$ is:

(A) $y=1$ (B) $y=2$ (C) $y=-1$ (D) $y=-2$

(29) $\lim_{x\to\infty} \dfrac{x^2+x}{3-x^2} =$

(A) ∞ (B) $-\infty$ (C) 1 (D) -1

(30) The horizontal and vertical asymptotes for $f(x) = \frac{2x+1}{x-5}$ are:

(A) $y=2, x=5$ (B) $y=5, x=2.$

(C) $y=-1,\ x=5$ (D) $y=2, x=-6$