

Solved

A

King Abdul Aziz University Faculty of Sciences Mathematics Department
 Math 110 Second Test Fall 2012 (30 Marks) Time 90 m
 Student Name: Student Number: A

1) $\frac{9\pi}{5}$ rad =

☐ A 216°

☐ B 252°

☐ C 288°

☒ D 324°

2) $240^\circ =$

☒ A $\frac{4\pi}{3}$ rad.

☐ B $\frac{5\pi}{3}$ rad.

☐ C $\frac{7\pi}{3}$ rad.

☐ D 3π rad.

3) Find the inverse of the function $f(x) = (2x + 7)^2, x \in [0, \infty)$.

☐ A $(2x + 7)^{-2}$

☐ B $\frac{\sqrt{x} + 7}{2}$

☐ C $\frac{x - \sqrt{7}}{2}$

☒ D $\frac{\sqrt{x} - 7}{2}$

4) If $9^{(x-1)} = 81$, then $x =$

☒ A 3

☐ B $\frac{1}{3}$

☐ C 1

☐ D -1

5) $\log_2 64 - \log_2 32 - \log_2 2 =$

☐ A -2

☐ B 12

☐ C -10

☒ D 0

6) The inverse of $f = \{(-4, 3), (-2, 1), (4, -1), (0, -2), (9, 7)\}$ is

☐ A $f^{-1} = \{(-4, 3), (1, -2), (-1, 4), (-2, 0), (7, 9)\}$

☐ B $f^{-1} = \{(-4, 3), (-2, 1), (4, -1), (-2, 0), (7, 9)\}$

☐ C $f^{-1} = \{(-2, 1), (4, -1), (0, -2), (9, 7), (-4, 3)\}$

☒ D $f^{-1} = \{(3, -4), (1, -2), (-1, 4), (-2, 0), (7, 9)\}$

7) If $\ln(x + 5) = 7$, then $x =$

☐ A e^7

☐ B 7

☐ C $e^7 + 5$

☒ D $e^7 - 5$

8) $\frac{\sin x}{\cos x} =$

☐ A $\cot x$

☒ B $\tan x$

☐ C $\sec x$

☐ D $\csc x$

9) $e^{4 \ln 2} =$

☒ A 16

☐ B 2

☐ C 4

☐ D 8

10) $\lim_{x \rightarrow 2} (2x^3 - 3x^2 + 1) =$

☐ A 1

☐ B 0

☒ C 5

☐ D -5

11) If $\alpha = \tan^{-1}\left(\frac{1}{2}\right)$, then $\sec \alpha =$

☐ A $\frac{2}{\sqrt{5}}$

☐ B $\sqrt{5}$

☐ C $\frac{1}{\sqrt{5}}$

☒ D $\frac{\sqrt{5}}{2}$

12) $\lim_{x \rightarrow 0} \frac{x}{\sqrt{x+16}-4} =$

☐ A $\frac{1}{8}$

☒ B 8

☐ C $-\frac{1}{8}$

☐ D -8

13) $\cot\left(\frac{\pi}{3}\right) =$

☐ A $\frac{1}{\sqrt{2}}$

☐ B $\frac{\sqrt{3}}{2}$

☒ C $\frac{1}{\sqrt{3}}$

☐ D $\frac{2}{\sqrt{3}}$

14) If $\lim_{x \rightarrow 3} \frac{f(x)+4}{x+1} = 4$, then $\lim_{x \rightarrow 3} f(x) =$

☐ A 8

☒ B 12

☐ C 2

☐ D 11

15) $\lim_{x \rightarrow 1} \frac{x^2 + 2x - 3}{x^2 + 6x - 7} =$

☐ A does not exist

☐ B 0

☒ C $\frac{1}{2}$

☐ D 2

16) $\lim_{x \rightarrow 0} \frac{x^3 - 7x^2}{x^2} =$

☐ A 7

☒ B -7

☐ C -14

☐ D 0

17) $\lim_{x \rightarrow 0} \frac{\sin(2x)}{\sin(5x)} =$

☒ A $\frac{2}{5}$

☐ B 0

☐ C 5

☐ D $\frac{5}{2}$

18) If $f(x) = \sin x$, then $D_f =$

☐ A $[-1, 1]$

☐ B $(-\infty, -1)$

☒ C $\mathbb{R} = (-\infty, \infty)$

☐ D $(-\infty, 1]$

19) If $f(x) = \begin{cases} 2x+3 & ; x \geq -2 \\ 2x+5 & ; x < -2 \end{cases}$, then $\lim_{x \rightarrow (-2)^+} f(x) =$

☒ A -1

☐ B 1

☐ C 3

☐ D 5

20) $\lim_{x \rightarrow 3^+} \frac{|x-3|}{x-3} =$

☐ A -1

☒ B 1

☐ C 0

☐ D does not exist

21) $\lim_{x \rightarrow 7} \frac{x-7}{x^2-49} =$

☐ A $\frac{1}{7}$

☒ B $\frac{1}{14}$

☐ C 14

☐ D 0

22) $\lim_{x \rightarrow \infty} \frac{5x^3 + 2x - 3}{2x^3 + 6x - 7} =$ ☐ A does not exist ☐ B 0 ☒ C $\frac{5}{2}$ ☐ D ∞
23) If $\sin(x) = \frac{2}{3}$, and $0 < x < \frac{\pi}{2}$, then $\cot(x) =$ ☒ A $\frac{\sqrt{5}}{2}$ ☐ B $\frac{2}{\sqrt{5}}$ ☐ C $\frac{\sqrt{5}}{3}$ ☐ D $\frac{3}{\sqrt{5}}$
24) If $4x - 6 \leq f(x) \leq x + 3$, then $\lim_{x \rightarrow 3} f(x) =$ ☐ A does not exist ☐ B 1 ☒ C 6 ☐ D 0
25) If $f(x) = \cos x$, then $R_f =$ ☒ A $[-1, 1]$ ☐ B $(-1, 0]$ ☐ C $\mathbb{R} = (-\infty, \infty)$ ☐ D $(0, 1)$
26) Find the domain of the function $f(x) = \sin^{-1}(3x + 5)$. ☐ A $\left(-2, -\frac{4}{3}\right)$ ☒ B $\left[-2, -\frac{4}{3}\right]$ ☐ C $[-2, 2]$ ☐ D $\left[-2, \frac{4}{3}\right]$
27) $\lim_{x \rightarrow 0} \frac{x^2 + 3x - 5}{x^2 - 3} =$ ☐ A does not exist ☐ B $-\frac{5}{3}$ ☒ C $\frac{5}{3}$ ☐ D 5
28) Find the inverse of the function $f(x) = \sqrt[7]{x^3}$. ☐ A $\sqrt[7]{x}$ ☐ B $\frac{1}{\sqrt[7]{x^3}}$ ☐ C $-\sqrt[7]{x^3}$ ☒ D $\sqrt[7]{x^7}$
29) Find the range of the function $f(x) = 2^x$. ☒ A $(0, \infty)$ ☐ B $\mathbb{R} = (-\infty, \infty)$ ☐ C $(-\infty, 0)$ ☐ D $[-1, 1]$
30) Find the domain of the function $f(x) = 2^x$. ☐ A $(0, \infty)$ ☒ B $\mathbb{R} = (-\infty, \infty)$ ☐ C $(-\infty, 0)$ ☐ D $[-1, 1]$