Kingdom of Saudi Arabia
King AbdulAziz University
Faculty of Science
Dept. of Mathematics

Math 110 " Exam A "

First semester 1431/1432

Instructions. (30 points) solve each of the following problems and choose the correct answer:

1- If $0 < a < b$ **then** $\frac{1}{a} > \frac{1}{b}$

a) True **b) False**

2- If $|x| > 8$ **then** $-8 < x < 8$

1. **a) True** **b) False**

3- If $x^2 - 4 \leq 0$ **then** $x \in$

a) $[-2,2]$ **b)** $(-2,2)$

c) $(-\infty,-2] \cup [2,\infty)$ **d)** $(-\infty,-2) \cup (2,\infty)$

4- The value $|2-\pi| =$

a) $2-\pi$ **b)** $-2-\pi$

c) $\pi - 2$ **d)** $\pi + 2$

5- The solution set of $0 \leq 2 - x \leq 2$ **is**

a) $[-2,0]$ **b)** $[-2,0)$

c) $[0,2]$ **d)** $(-\infty,-2] \cup (0,\infty)$

6- The equation of the horizontal line that passes through the point $(5,2)$ **is**

a) $y = 5$ **b)** $y = 2$

c) $x = 5$ **d)** $x = 2$

7- The x**-intercept and the** y**-intercept of the line** $4x - 3y = 12$

a) x**-intercept** $= -4, y$**-intercept** $= -3$ **b)** x**-intercept** $= 4, y$**-intercept** $= 3$

c) x**-intercept** $= -3, y$**-intercept** $= 4$ **d)** x**-intercept** $= 3, y$**-intercept** $= -4$

8- The slope of the line $y = 10$ **is**

a) Undefined **b)** 2

c) 0 **d)** $\frac{1}{2}$

9- If the distance between the points $(a,1),(9,4)$ is 5 then $a =$

a) -3 b) 5

c) 2 d) 3

10- If a circle has radius 6 cm , then the length of the arc subtended by a central angle of $\pi/3$ is

a) $360°$ b) $60°$

c) $\frac{\pi}{3}$ d) 2π

11- Simplifying the expression $\csc y - \sin y$ gives

1. a) $\cot y \sin y$ b) $\cot y \csc y$

c) $\cot y \cos y$ d) $\cot y \sec y$

12- If $\cos x = \frac{-4}{5}, x \in \left[\frac{\pi}{2}, \pi\right]$, then $\tan x =$

a) $\frac{3}{4}$ b) $\frac{-3}{4}$

c) $\frac{4}{3}$ d) $\frac{-4}{3}$

13- The value of $\cos^2\left(\frac{3\pi}{4}\right) =$

a) $\frac{1}{2}$ b) $\frac{-1}{2}$

c) 1 d) 0

14- The domain of the function $f(x) = \frac{1}{\sqrt{x^2+10}}$ is

a) $[-10,10]$ b) $(-10,10)$

c) $[-10,10)$ d) R

15- If $f(x) = \begin{cases} x-1 \text{ if } x \geq 3 \\ \sqrt{x} \quad \text{if } x < 3 \end{cases}$ then $f(-27) =$

a) -3 b) 3

c) -9 d) Undefined

16- The function $f(x) = \frac{x}{|x|+1}$ is

a) An odd function b) An even function

c) An even and odd function d) Neither even nor odd function

17- The function $f(x) = |x+1|$ **is increasing on the interval**

a) $[0,\infty)$ **b)** $[-1,\infty)$

c) $[1,\infty)$ **d)** $(-\infty,-1]$

18- The function $f(x) = \dfrac{x^3+5x}{\sqrt[3]{x}+\frac{1}{2}}$ **is**

a) A rational function **b) An algebraic function**

c) A power function **d) An exponential function**

19- The degree of the polynomial $P(x) = 9$ **is**

a) 7 **b)** 8

c) 0 **d)** 2

20- The domain of the function $g(x) = \dfrac{2x^2-1}{x^2+2x-3}$ is

a) $(-\infty,0)\cup(0,1)\cup(1,\infty)$ **b)** $(-\infty,-3]\cup[-3,1)\cup(1,\infty)$

c) $(-\infty,-3)\cup(-3,1]\cup[1,\infty)$ **d)** $(-\infty,-3)\cup(-3,1)\cup(1,\infty)$

21- A form of the exponential function is

a) $g(x) = 3.75^{-x}$ **b)** $f(x) = x^{-3.75}$

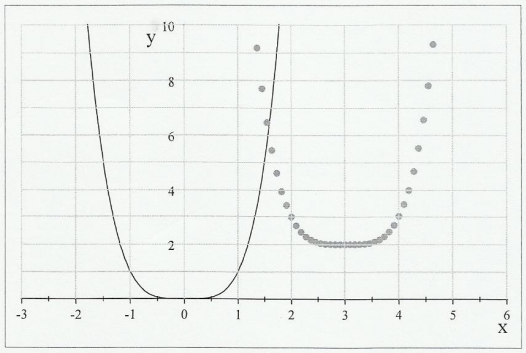
c) $h(x) = a^{-3.75}$ **d)** $h(x) = -3.75^{-x}$

22- If $f(x) = x^2+1$ **and** $g(x) = \sqrt{x-4}$, **then the domain of** $(f\circ g)(x)$ **is**

a) $(-\infty,\infty)$ **b)** $(-\infty,-4]$

c) $[4,\infty)$ **d)** $(-4,4)$

23- The accompanying figure shows the graph of $y = x^4$ **shifted to a new position. An equation for the new position is**



a) $y = (x-3)^4 + 2$ b) $y = (x-2)^4 + 3$

c) $y = (x-3)^4$ d) $y = (x-2)^4$

1. **24- If the graph of $y = 3^x$ is reflected about the x-axis and then about the y-axis, an equation for the new graph is**

a) $y = 3^{-x}$ b) $y = -3^{-x}$

c) $y = -3^x$ d) $y = 3^{-x} + 3$

25- If the function $f(x) = x^2$ and the function $g(x) = \sin(x)$ then $(f \circ g)(x) =$

a) $x^2 \cos(x)$ b) $2x\cos(x)$

c) $\cos(x^2)$ d) $1 - \cos^2(x)$

26- If the function $f(x) = 3^x$ and the function $g(x) = 9^{x-1}$ then $f(x)g(x) =$

a) 3^{3x-2} b) 3^{2x-1}

c) 27^{x^2-x} d) 9^{2x-1}

27- The function $f(x) = (\frac{3}{5})^x$ is

a) **Increasing** $\forall x$ b) **Increasing** $\forall x \in (0, \infty)$

c) **Decreasing** $\forall x$ d) **Decreasing** $\forall x \in (-\infty, 0)$

28- The domain of the function $f(x) = \frac{x^2+5}{e^x-1}$ **is**

a) $(-\infty, \infty)$ **b)** $(-\infty, 1) \cup (1, \infty)$

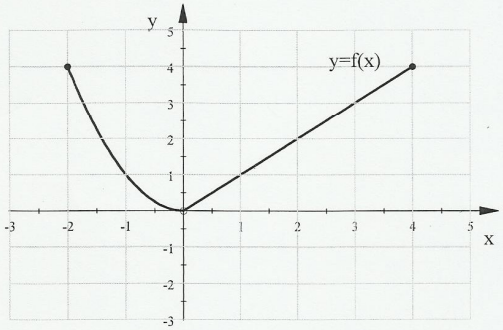
c) $(-\infty, 0) \cup (0, \infty)$ **d)** $(-\infty, 0) \cup (1, \infty)$

29- Simplifying the function $f(x) = \frac{e^x - e^{-x}}{e^x}$ **gives**

a) 2 **b)** e^{2x}

c) e^{-2x} **d)** $1 - e^{-2x}$

30- The accompanying figure shows the graph of $y = f(x)$**. The range of** $f(x)$ **is**



a) $(-3, 0) \cup (0, 5)$ **b)** $(0, 5)$

c) $(0, 4]$ **d)** $(-3, 5)$