The Hashemite University — Calculus I — Date 20 -10-2012

Department of Mathematics — First Exam — Time: One Hour

اسم الطالب: نضال نواف رضا — الرقم الجامعي: ١٢٣٤٦٦١ — الرقم المتسلسل: 77

وقت المحاضرة: ٩-١٠ — أسم المدرس : رانيا شقبوعة

١	٢	٣	٤	٥	٦	٧	٨	٩	١٠	١١	١٢	13
a	a	a	a	a	a	a	a	a	a	a	a	a
b	b	b	b	b	b	b	b	b	b	b	b	b
c	c	c	c	c	c	c	c	c	c	c	c	c
d	d	d	d	d	d	d	d	d	d	d	d	d

25/25

Q1) Which of the following an even function?

a) $x^2 +3x$ b) $2 - 3x$ c) $1 + 2\cos x$ d) $\dfrac{x^3 - x}{1+x^2}$

Q2) If $f(x) = \frac{6x-2}{3x+1}$, then $f^{-1}(x) =$

a) $\frac{9x-1}{x-3}$ b) $\frac{1-9x}{x+2}$ c) $\frac{x+2}{6-3x}$ d) $\frac{1-x}{2x+6}$

Q3) The range of $f(x) = \frac{6x-2}{3x+1}$ is

a) R-{-2} b) R-{-3} c) R-{2} d) R-{3}

Q4) Let $f(x) = \sin\sqrt{32-2x^2}$, then the domain of f is:

a) $(-4,4)$ b) $[0,4]$ c) $(-\infty,-4)\cup(4,\infty)$ d) $[-4,4]$

Q5) The value(s) of x of such that $\log_x (6x - 8) = 2$ is:

a) –2 and –4 b) 4 only c) 2 and 4 d) 1 and 4

Q6) If $f(x) = 3x - 5$ and $(f\circ g)(x) = 12x^2 - 6x + 13$, then $g(0)$ is ________________.

a) 11 b) 6 c) 13 d) -5

Q7) If $f(x) = \dfrac{5}{x-3}$ and $g(x) = x^2 - 1$, then the domain of $(f\circ g)(x)$ is .

a)R-{1} b) R-{3} c) R-{-2,2,3} d) R-{-2,2}

Q8) Let $3e^{4x} = 1$, then the value of x is

a) $-ln\frac{1}{3}$ b) $\frac{1}{4}ln3$ c) $-\frac{1}{4}ln3$ d) $4ln\frac{1}{3}$

Q9) The range of $g(x) = -x^2 + 2x - 5$ is:

a) $(-\infty, 4]$ b) $(-\infty,-4]$ c) $[-4, +\infty)$ d) $[4, +\infty)$

Q10) If $f(x) = x^3 + 2x + 5$ then $f^{-1}(8) =$

a) -1 b) 0 c) 1 d) 2

Q11) If $f(x) = x^3 + 2x + 3$ find the value of x such that $f^{-1}(x) = 1$

a) 6 b) 8 c) 10 d) 7

Q12) $\cos^{-1}(\cos(\frac{11\pi}{6}))$

a) $\frac{\pi}{6}$ b) $\frac{11\pi}{6}$ c) $\frac{5\pi}{6}$ d) $\frac{7\pi}{6}$

Q13) $sec(cos^{-1}(x)) =$

a) x b) $\frac{1}{x}$ c) $\frac{\sqrt{x^2-1}}{x}$ d) $\sqrt{1-x^2}$

Q1)

a) $x^2 + 3x$
even + odd $\Rightarrow$

b) $2 - 3x$
odd

c) $1 + 2\cos 1$
even

d) $\frac{x^3 - x}{1 + x^2}$
odd

The answer is "c"

Q2) $F(x) = \frac{6x - 2}{3x + 1}$

find $f^{-1}(x)$.

$\frac{6x - 2}{3x + 1} = y \Rightarrow 3yx + y = 6x - 2$

$y + 2 = 6x - 3yx$

$y + 2 = x(6 - 3y)$

$x = \frac{y + 2}{6 - 3y} \Rightarrow f^{-1}(x) = \frac{x + 2}{6 - 3x}$

the answer is "c"

Q3) the range of $\frac{6x - 2}{3x + 1}$

Range f = Domain $f^{-1}(x)$

$\Rightarrow$ Range f $R - \{2\}$

the answer is "c"

Q4) $F(x) = \sin\sqrt{32 - 2x^2}$

Find the domain of f

$32 - 2x^2 > 0$

$2(16 - x^2) > 0$

+++ +++ - - -
-4 4

Domain $F(x) = [-4, 4]$

the answer is "d"

Q5)

$\log_x (6x - 8) = 2$

$x^2 = 6x - 8$

$x^2 - 6x + 8 = 0$

$(x - 4)(x - 2) = 0 \Rightarrow x = 4, 2$

the answer is "c"

Q6) $f(x) = 3x - 5$,

$(f\circ g)(x) = 12x^2 - 6x + 13$

$f(g(x)) = 12x^2 - 6x + 13$

$3g(x) - 5 = 12x^2 - 6x + 13$

$g(x) = 4x^2 - 2x + 6$

$g(0) = 6 \Rightarrow$ the answer is "b"

Q7)

the first solution:

$(f\circ g)(x) = f(g(x)) = f(x^2 - 1)$

$= \frac{5}{x^2 - 4}$, $D = R - \{2, -2\}$

$D_{f\circ g} = D \cap D_{g(x)} = R - \{2, -2\} \cap R$

$= R - \{2, -2\}$

the second solution:

$D_{f\circ g} \in \{D_g , g(x) \in D_f\}$

$g(x) \in R - \{3\}$

$D_g = R$,

$g(x) \neq 3$

$x^2 - 1 \neq 3$

$\Rightarrow x \neq 2, -2$

$D_{f\circ g} = R - \{2, -2\}$

the answer is "d"

Final Exam

⑧ $3e^{4x} = 1$, find the value of x.

$e^{4x} = \frac{1}{3}$

$\ln e^{4x} = \ln \frac{1}{3}$

$4x = \ln \frac{1}{3} \Rightarrow 4x = \ln 1 - \ln 3$

$4x = -\ln 3$

$\Rightarrow x = \frac{-1}{4} \ln 3$

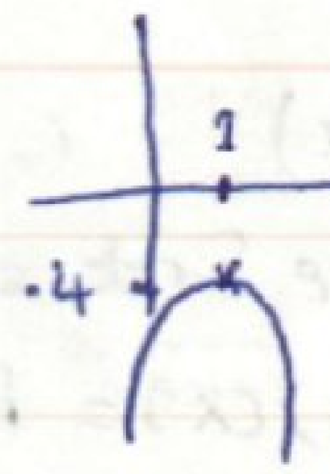
the answer is "c"

⑨ the rang of $g(x) = -x^2 + 2x - 5$

$g'(x) = 0 \Rightarrow -2x + 2 = 0$

$x = 1$

$g(1) = -4$



The range is $(-\infty, -4]$.

the answer is "b"

⑩ $f(x) = x^3 + 2x + 5$

then $f^{-1}(8)$

$x^3 + 2x + 5 = 8$

عن طريق تعويض الخيارات

c) 1

بطلع 8 =

⑪ $f(x) = x^3 + 2x + 3$

$f^{-1}(x) = 1$

نعوض (1) في معادلة $f(x)$

$f(1) = 1 + 2 + 3 = 6$

The answer is a) 6

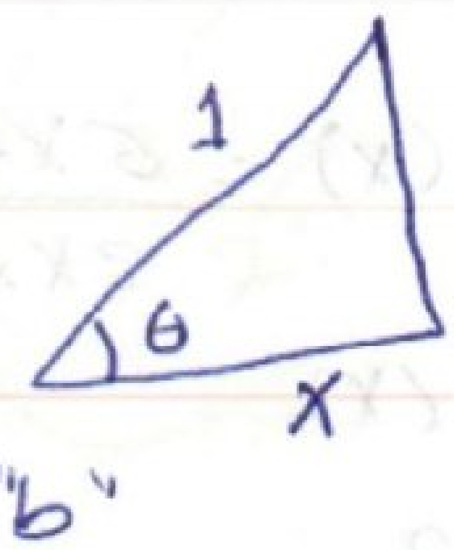
⑫ $\cos^{-1}(\cos(\frac{11\pi}{6}))$

$2\pi - \frac{11\pi}{6} = \frac{\pi}{6}$

the answer is "a"

⑬ $\sec(\cos^{-1}(x)) =$

$\sec = \frac{1}{\cos} = \frac{1}{x}$



the answer is "b"

By Nidal Nassar

First

The Hashemite University
Math. Department

Calculus I, First Exam
First semester 2009/2010

قرش 20.

Date Nov 2, 2009
Time: 1 hour

اسم الطالب:.. الرقم الجامعي: | | | | | | | | | |

الرقم المتسلسل:........ موعد المحاضرة:............. اسم مدرس المادة:...................

Warning : Calculators are not allowed in this examination.

Part I: Select the best correct answer and fill it in the following table: (2 points each)

	1	2	3	4	5	6	7	8	9	10	11	12	13
a													
b													
c													
d													

1. The graph of the function $f(x) = x^3-3x^2+3x-1$ can be obtained by translating the graph of the function $f(x) = x^3$

(a) left 3 units (b) right 3 units
(c) right 1 unit (d) left1 unit

2. Let $f(x) = x^3+4x+1$. Then if $f^{-1}(c^3) = c$, then $c =$

(a) 0 (b) $\frac{-1}{4}$ (c) 1 (d) $\frac{1}{4}$

3. $\lim\limits_{x\to 3^+} \frac{\sqrt{x^2-6x+9}}{x-3} =$

(a) -1 (b) 1 (c) ∞ (d) $-\infty$

4. The function $f(x) = \frac{x^2-9}{x^2-5x+6}$ has vertical asymptote(s) at $x =$

(a) 3 and -3 (b) 3 (c) 3 and 2 (d) 2

5. The function $f(x) = \frac{4x-9}{\sqrt{x^2+5}+3x}$ has horizontal asymptote(s) at $y =$

(a) 4 and -4 (b) 4 (c) 1 and 2 (d) 1 and -2

6. Let $f(x) = \frac{x}{x-1}$ and $g(x) = \frac{1}{x-2}$. Then $dom(f \circ g) =$

(a) $\mathbb{R}-\{2,3\}$ (b) $\mathbb{R}-\{2\}$
(c) $\mathbb{R}-\{1,2,3\}$ (d) $\mathbb{R}-\{1,2\}$

7. $\lim\limits_{x\to 2} \frac{\sqrt[3]{x+6}-2}{x-2} =$

(a) $\frac{1}{12}$ (b) $\frac{1}{4}$ (c) $\frac{1}{8}$ (d) $\frac{1}{3}$

domain of the function $f(x) = \dfrac{x}{|x-1|-1}$ is

$\{0,1\}$ (b) $\mathbb{R} - \{0,2\}$
$\{1\}$ (d) $\mathbb{R} - \{2\}$

range of the function $f(x) = -3\sin^2 x$ is

] (b) $[-3,3]$ (c) $[-3,0]$ (d) $[0,1]$

plane curve $y = \sin x \cos y$ is symmetric about the

$axis$ (b) $y - axis$
in (d) none of the above

$f(x) = x - 5x^2$, $x \geq 1$. Then $f^{-1}(x) =$

$\sqrt{\frac{1}{100}+\frac{x}{5}}$ (b) $\frac{1}{10} - \sqrt{\frac{1}{100}+\frac{x}{5}}$

$\sqrt{\frac{1}{100}-\frac{x}{5}}$ (d) $\frac{1}{10} - \sqrt{\frac{1}{100}-\frac{x}{5}}$

period of the function $f(x) = 3\sin(\frac{x}{2}+4)$ is

(b) 4π (c) π (d) $\frac{1}{4\pi}$

$p > 0$. Then $\lim_{x\to\infty} x^{-2p+1} = 0$ if

(b) $p < \frac{1}{2}$ (c) $p < 0$ (d) $p = \frac{1}{2}$

نماذج (١)

The Hashemite University
Math. Department

Calculus I, First Exam
First semester 2009/2010

Date Nov 2, 2009
Time: 1 hour

اسم الطالب:.. الرقم الجامعي: | | | | | | | | | |

الرقم المتسلسل:......... موعد المحاضرة:............. اسم مدرس المادة:...................

Warning : Calculators are not allowed in this examination.

Part I: Select the best correct answer and fill it in the following table: (2 points each)

	1	2	3	4	5	6	7	8	9	10	11	12	13
a													
b													
c													
d													

1. The graph of the function $f(x) = x^3 - 3x^2 + 3x - 1$ can be obtained by translating the graph of the function $f(x) = x^3$

(a) left 3 units (b) right 3 units
(c) right 1 unit (d) left1 unit

2. Let $f(x) = x^3 + 4x + 1$. Then if $f^{-1}(c^3) = c$, then $c =$

(a) 0 (b) $\frac{-1}{4}$ (c) 1 (d) $\frac{1}{4}$

3. $\lim\limits_{x \to 3^+} \frac{\sqrt{x^2 - 6x + 9}}{x - 3} =$

(a) -1 (b) 1 (c) ∞ (d) $-\infty$

4. The function $f(x) = \frac{x^2 - 9}{x^2 - 5x + 6}$ has vertical asymptote(s) at $x =$

(a) 3 and -3 (b) 3 (c) 3 and 2 (d) 2

5. The function $f(x) = \frac{4x - 9}{\sqrt{x^2 + 5} + 3x}$ has horizontal asymptote(s) at $y =$

(a) 4 and -4 (b) 4 (c) 1 and 2 (d) 1 and -2

6. Let $f(x) = \frac{x}{x - 1}$ and $g(x) = \frac{1}{x - 2}$. Then $dom(f \circ g) =$

(a) $\mathbb{R} - \{2, 3\}$ (b) $\mathbb{R} - \{2\}$
(c) $\mathbb{R} - \{1, 2, 3\}$ (d) $\mathbb{R} - \{1, 2\}$

7. $\lim\limits_{x \to 2} \frac{\sqrt[3]{x + 6} - 2}{x - 2} =$

(a) $\frac{1}{12}$ (b) $\frac{1}{4}$ (c) $\frac{1}{8}$ (d) $\frac{1}{3}$

e domain of the function $f(x) = \frac{x}{|x-1|-1}$ is

$- \{0,1\}$ (b) $\mathbb{R} - \{0,2\}$
$- \{1\}$ (d) $\mathbb{R} - \{2\}$

e range of the function $f(x) = -3\sin^2 x$ is

3] (b) $[-3,3]$ (c) $[-3,0]$ (d) $[0,1]$

he plane curve $y = \sin x \cos y$ is symmetric about the

$- axis$ (b) $y - axis$
igin (d) none of the above

et $f(x) = x - 5x^2$, $x \geq 1$. Then $f^{-1}(x) =$

$+\sqrt{\frac{1}{100}+\frac{x}{5}}$ (b) $\frac{1}{10} - \sqrt{\frac{1}{100}+\frac{x}{5}}$
$+\sqrt{\frac{1}{100}-\frac{x}{5}}$ (d) $\frac{1}{10} - \sqrt{\frac{1}{100}-\frac{x}{5}}$

ne period of the function $f(x) = 3\sin(\frac{x}{2}+4)$ is

(b) 4π (c) π (d) $\frac{1}{4\pi}$

t $p > 0$. Then $\lim_{x\to\infty} x^{-2p+1} = 0$ if

$\frac{1}{2}$ (b) $p < \frac{1}{2}$ (c) $p < 0$ (d) $p = \frac{1}{2}$

e Hashemite University
partment of Mathematics
lculus 101

(١)

First Exam
Date: 24/3 / 2008
Time: One hour

الرقم الجامعي:

اسم الطالب:

الشعبة: ....وقت المحاضرة: ....الرقم المتسلسل: ....مدرس المادة: ....

	1	2	3	4	5	6	7	8	9	10	11	12	13
(a)		X			X		X	X	X		X		
(b)													
(c)	X									X		X	
(d)			X	X		X							X

***This exam consists of 13 multiple choice questions with 2 points each. Select the best correct answer and fill your answer in the above table.**

1. If $f(x)=\sqrt{x-1}$, $g(x)=\dfrac{2}{x}$ then the domain of $f\circ g$ is

(a) $[0,2)$ (b) $(0,2]$ (c) $(-\infty,2]$ (d) $[0,+\infty)$

2. The domain of $f(x)=\sqrt{\dfrac{x-1}{x+2}}$ is

(a) $(-2,\infty)$ (b) $[1,+\infty)$ (c) $(-\infty,-2)\cup[1,+\infty)$ (d) $(-2,1]$

3. If $Dom(f)=[1,4]$, then $Dom(f(3x+4))$ is

(a) $[-1,0]$ (b) $[2,6]$ (c) $[1,4]$ (d) $[3,16]$

4. The range of $f(x)=\dfrac{5}{3-\cos(2x)}$ is

(a) $[-1,0]$ (b) $[-1,1]$ (c) $[\frac{5}{4},\frac{5}{2}]$ (d) $(-\infty,\infty)$

5. $\lim\limits_{x\to1^+}\dfrac{x^4-1}{x-1}$ is

(a) 4 (b) 1 (c) $-\infty$ (d) $+\infty$

6. If $f(3x)=\dfrac{x}{x^2+1}$, then $f(x)=$

(a) $\dfrac{x}{x^2+3}$ (b) $\dfrac{3x}{x^2+9}$ (c) $\dfrac{x}{x^2+9}$ (d) $\dfrac{3x}{x^2+1}$

7. If $f(x)=-2x^5+\dfrac{7}{8}$, then $f^{-1}(-1)=$

(a) $\sqrt[5]{\dfrac{15}{16}}$ (b) $\dfrac{15}{16}$ (c) $-\sqrt[5]{\dfrac{15}{8}}$ (d) $\sqrt[5]{\dfrac{15}{8}}$

8. $\lim\limits_{x\to0^+}\dfrac{1}{x}-\dfrac{1}{x^3}$ is

(a) $-\infty$ (b) $+\infty$ (c) 0 (d) does not exist

9. $\lim_{x \to -\infty} \frac{\sqrt{5x^2 - 2}}{x + 2}$

(a) 0 (b) $\sqrt{5}$ (c) $+\infty$ (d) $-\sqrt{5}$

10. The graph of $y^3 = |x| - 5$ is symmetric about the

(a) origin only (b) x-axis only (c) y-axis only (d) origin, x-axis, and y-axis

11. The vertical asymptote(s) of $f(x) = \frac{2(x^2 + x)}{x^3 - x}$ is(are)

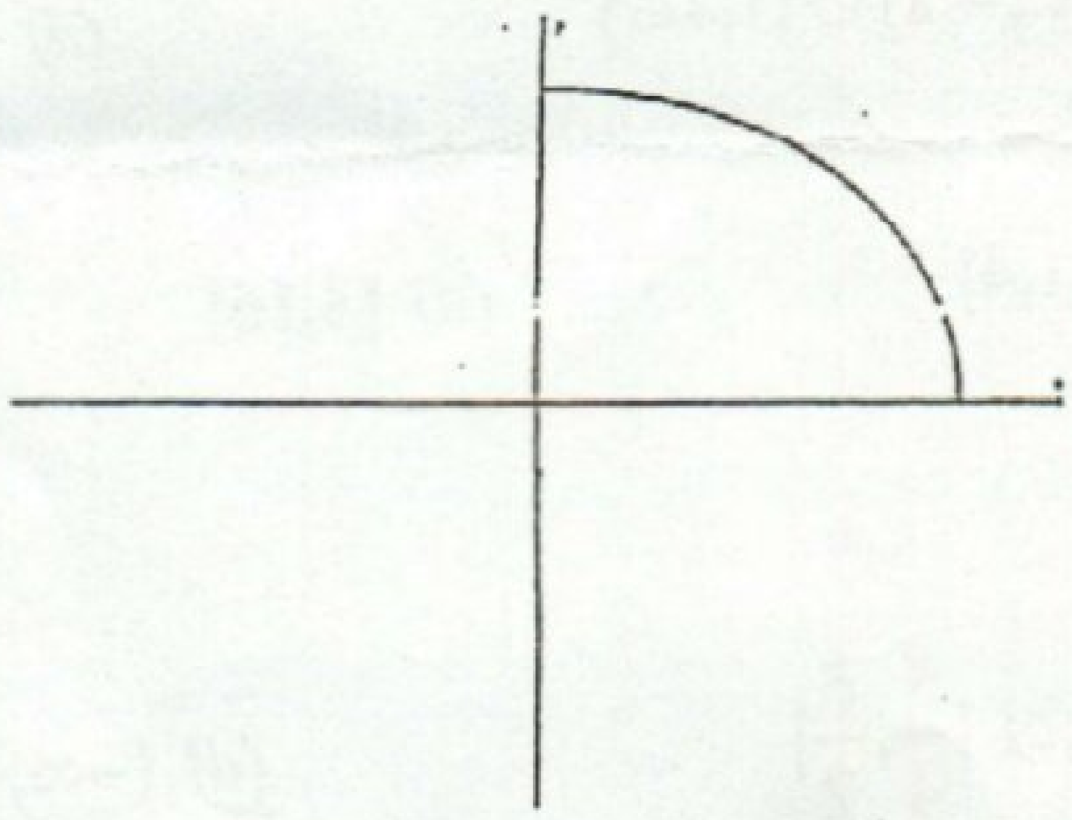
(a) $x = 1$ (b) $x = -1$ (c) $x = -1, x = 1$ (d) $x = 0$

12. $\lim_{x \to +\infty} \sqrt{25x^2 - 5x} - 5x$ is

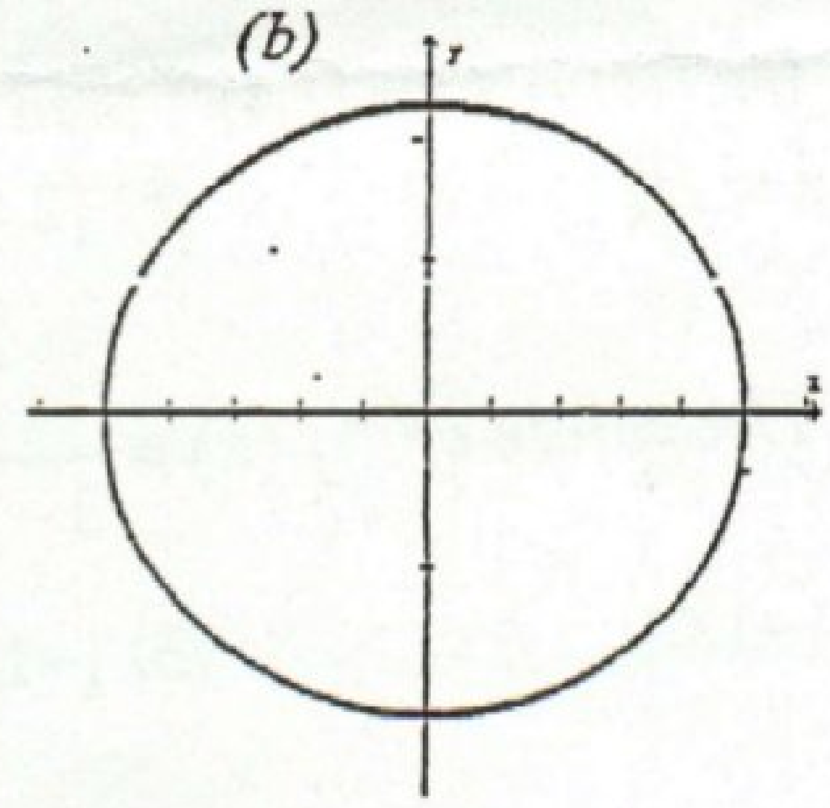
(a) $-\frac{1}{2}$ (b) $-\frac{3}{10}$ (c) $+\infty$ (d) $-\infty$

13. The graph of the parametric curve $x = \sin t$, $y = \cos t$, $-\frac{\pi}{2} \le t \le 0$ is

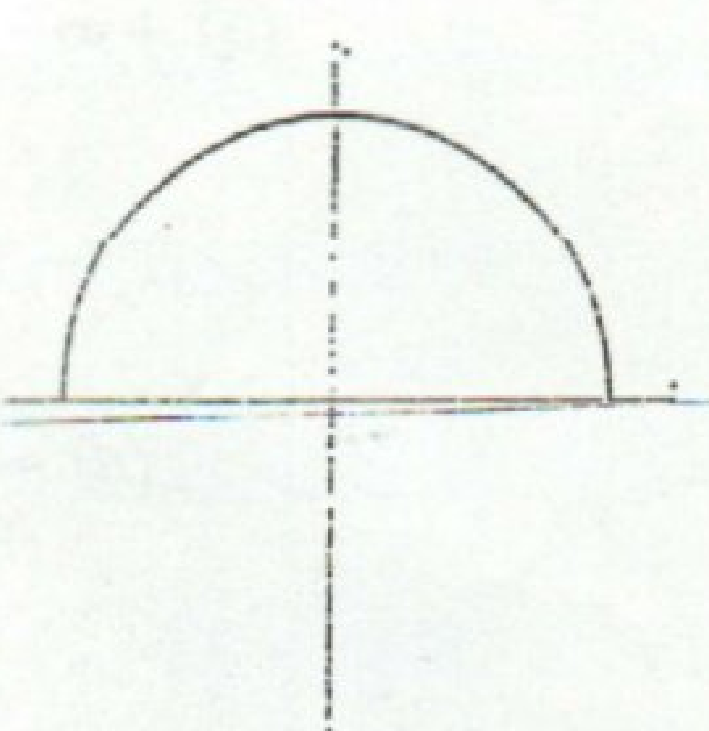
(a)



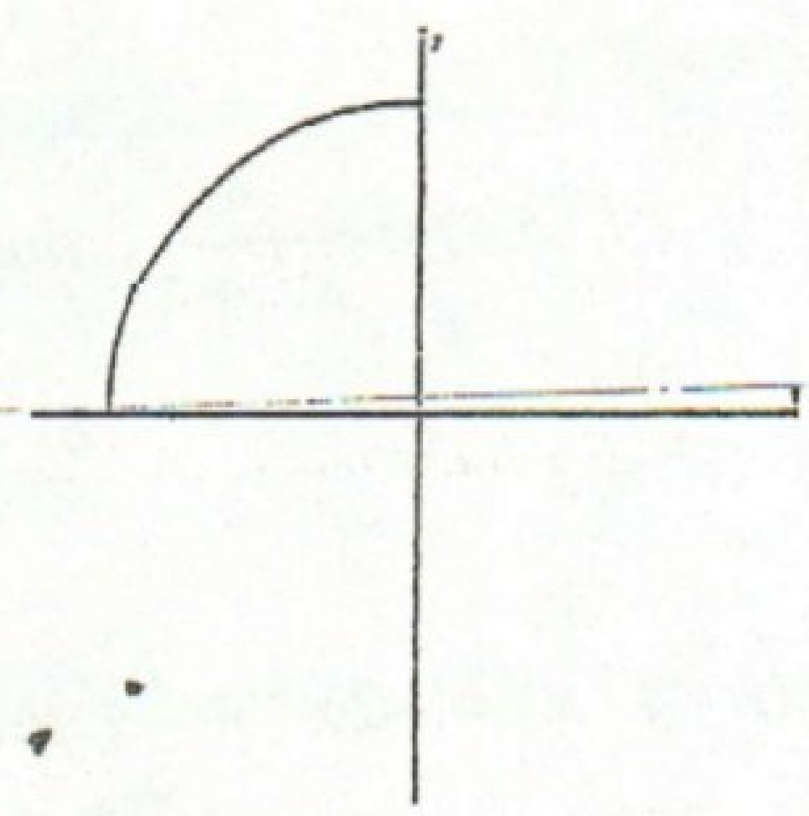
(b)



(c)



(d)



GOOD LUCK

The Hashemite University
Dept. Of Mathematics
Name [redacted]

Exam 1
Calculus (1)
Number [redacted]

First Semester
2002/2003
Instructor

6

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Total
1/2			1	2.5		1.5	7

Question (1): Show that the equation $x^3 + x^2 - 2x = 1$ has at least one solution in the incterval $[-1,1]$. (3 points)

Question (2): Find the amplitude, period, and sketch the graph of

$$y = \frac{1}{2}\cos(3x - \pi).$$

(3 points)

Question (3): Sketch the curve that represented by parmetric equations and indicate the direction

$$x = t, \quad y = 1 - \sqrt{1 - t^2}, \quad |t| \le 1$$

(3 points)

ept. Of Mathematics . Final Exam Date:14/1/2003
الشعبة: الرقم: الاسم:

1. Let $f(x) = \sqrt{1+x}$ and $(f\circ g)(x) = x$. Find $g(x)$. (4 points)

Q2. Evaluate $\displaystyle\int \frac{dx}{\left(\cos^2 x - \sin^2 x\right)^2}$. (4 points)

Q3. Find $\displaystyle\frac{d}{dx}\left(\int_x^0 \frac{1}{\cos t}\,dt\right)$. (4 points)

Hashemite University
Department

Calculus I, 1st Exam
1st semester 2003/2004

Time: 1 hour

اسم الطالب:..............................

الرقم الجامعي:

الرقم المتسلسل:......... موعد المحاضرة:.............. اسم مدرس المادة:.................

lect the best correct answer and fill it in the following table: (2.5 points each)

	1	2	3	4	5	6	7	8	9	10
(a)										
(b)										
(c)										
(d)										

1. If $f(x)=x^2-1, x\geq 0$ and $g(x)=\frac{1}{x}$, then the domain of $g \circ f$ is:

(a) $R\backslash\{-1,1\}$ (b) $[0,\infty)$ (c) $[0,1)\cup(1,\infty)$ (d) $(0,\infty)$.

2. $\lim_{x\to 0^+}\left(\frac{1}{x}-\frac{1}{x^2}\right)$ equals:

(a) $-\infty$ (b) $+\infty$ (c) 0 (d) none of the previous.

3. The graph of $f(x)=\frac{2x+x^2}{4-x^2}$ has a vertical asymptote at:

(a) -1 (b) 2 (c) -2 (d) $2,-2$.

4. The graph of the equation $\csc y=\frac{\sin x}{1+\sin^2 x}$ is symmetric about the:

(a) origin (b) y – axis (c) x – axis (d) none of the previous .

5. The amplitude and the period for the equation $2y=-4\sin\left(\frac{x}{2}+2\right)$ respectively, are:

(a) $-4, 4\pi$ (b) $4, 4\pi$ (c) $-2, 4\pi$ (d) $2, 4\pi$.

6. Eliminating the parameter t in the parametric equations $x=-2+\cos t, y=3\sin t$ induces the equation:

(a) $(x-2)^{\frac{1}{9}}+y^2=1$ (b) $9(x+2)^2+y^2=9$ (c) $(x+2)^2+y^2=1$ (d) $9(x-2)^2+y^2=9$.

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أحوال
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قليل
لماذا
ليش

Form A

3. $\lim\limits_{x \to ?} \frac{\ldots}{|2 - x^2|}$ equals:

(a) $\frac{-1}{2\sqrt{2}}$ (b) does not exist (c) $\frac{1}{2\sqrt{2}}$ (d) $\frac{1}{2}$.

4. Let $f(x) = \begin{cases} \dfrac{x^2 - 9}{x - 3} & \text{if } x \neq 3 \\ k & \text{if } x = 3 \end{cases}$, then the possible value (values) of k for which $\lim\limits_{x \to 3} f(x)$ exists is (are):

(a) $-\infty < k < \infty$ (b) 0 (c) 6 (d) none of the previous.

5. Eliminating the parameter t in the parametric equations $x = -2 + \cos t$, $y = 3\sin t$ induces the equation:

(a) $9(x+2)^2 + y^2 = 9$ (b) $(x-2)^2 + y^2 = 1$ (c) $(x+2)^2 + y^2 = 1$ (d) $9(x-2)^2 + y^2 = 9$.

6. Consider the function $f(x) = 2 - \sqrt[4]{1-x}$, then the range of f is:

(a) $[0, \infty)$ (b) $(-\infty, 2]$ (c) $(-\infty, 0]$ (d) $[2, \infty)$.

7. The graph of $f(x) = \dfrac{2x + x^2}{4 - x^2}$ has a vertical asymptote at:

(a) $2, -2$ (b) -2 (c) 2 (d) -1.

8. If $f(x) = x^2 - 1, x \geq 0$ and $g(x) = \dfrac{1}{x}$, then the domain of $g \circ f$ is:

(a) $[0,1) \cup (1, \infty)$ (b) $\mathbb{R} \setminus \{-1, 1\}$. (c) $(0, \infty)$ (d) $[0, \infty)$.

9. $\lim \left(\frac{1}{x} - \frac{1}{x^2}\right)$ equals:

(a) $+\infty$ (b) 0 (c) $-\infty$ (d) none of the previous.

10. The graph of the equation $\csc y = \dfrac{\sin x}{1 + \sin^2 x}$ is symmetric about the:

(a) Origin (b) y – axis (c) x – axis (d) none of the previous.

بســــــــــم اللــــــــه الرحمــــــــن الرحيــــــــم

The Hashemite University
Department of Mathematics
Calculus 101

First Exam
Date: 12/11/2005
Time: One hour

اسم الطالب: [redacted] الرقم الجامعي: [redacted]

الشعبة: ....وقت المحاضرة: [redacted] ....الرقم المتسلسل: [redacted] ...مدرس المادة: [redacted] ....

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
(a)																		
(b)																		
(c)																		
(d)																		

* This exam consists of 18 multiple choice questions, with 1.5 points for each question.

* Select the best correct answer and fill your answer in the above table.

1. *The number of vertical asymptotes of* $f(x) = \frac{x^3 - 27}{(x-3)(x+4)}$ *is*

(a) 1 *(b) 3* *(c) 2* *(d) 0*

2. *The horizontal asymptote(s) of* $f(x) = \frac{x}{|x| - 1}$ *is(are)*

(a) $y = 1$ *(b)* $y = -1$ *(c)* $y = 1, y = -1$ *(d)* $y = 0$

3. *The value(s) of k that makes the function* $f(x) = \begin{cases} 3x + 2k^2 & x \ge 0 \\ k & x < 0 \end{cases}$

continuous is(are):

(a) $0, \frac{1}{2}$ *(b)* $0, -\frac{1}{2}$ *(c) 0, 2* *(d) 0*

4. *If* $f(3x+5) = 6x + 11$, then $f(x)$ is

(a) $2x - 1$ *(b)* $2x + 1$ *(c)* $3x + 1$ *(d)* $3x - 1$

5. *The range of* $f(x) = 4 + \sqrt{9 - x^2}$ *is*

(a) $[4,7]$ *(b)* $[0,4]$ *(c)* $[4,6]$ *(d)* $[-4,0]$

6. $\lim_{x \to -\infty} \frac{\sqrt{3x^2 + 11}}{7 - 4x}$ *is*

(a) $-\frac{\sqrt{3}}{4}$ *(b)* $+\infty$ *(c)* $\frac{\sqrt{3}}{4}$ *(d) does not exist*

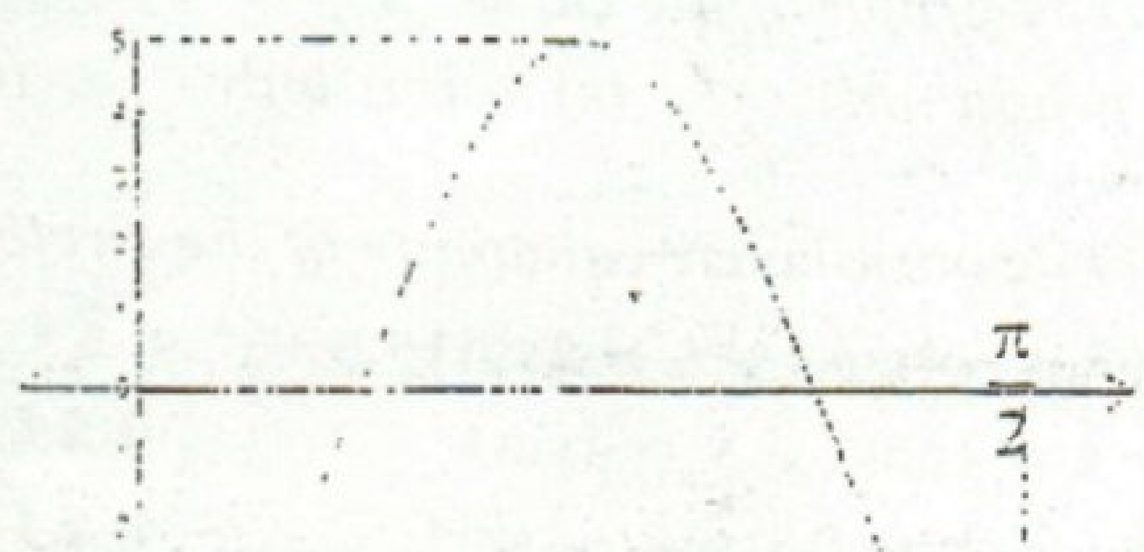
7. *The following graph represent the function*

(a) $f(x) = 5\cos 4x$

(b) $f(x) = -5\cos 4x$

(c) $f(x) = 5\cos 2x$

(d) none



8. *If* $f(x) = |x-3|$, then $f(x)$ is

(*a*) $\left|\dfrac{x^2+7x-9}{x+3}\right|$ (*b*) $\sqrt{\dfrac{(x-3)^2}{x-3}}$ (*c*) $\sqrt{\dfrac{|x-3|^2}{|x-3|}}$ (*d*) $\sqrt{x^2-6x+9}$

9. $\lim\limits_{x\to\infty} x - x^3 + 5x^2 + 11$ *is*

(*a*) *0* (*b*) $-\infty$ (*c*) $+\infty$ (*d*) *does not exist*

10. *If* $f(x) = x^2 + 3$, $g(x) = \sqrt{x}$ *then the domain of* $f \circ g$ *is*

(*a*) $[0,+\infty)$ (*b*) $(-\infty,0)$ (*c*) $(-\infty,+\infty)$ (*d*) *none*

11. *The graph of* $f(x) = 3 - |x-4|$ *is obtained from the graph of* $g(x) = |x-4|$ *:*

(*a*) *a reflection about the x-axis and a translation 3 units down*
(*b*) *a reflection about the y-axis and a translation 3 units up*
(*c*) *a reflection about the x-axis and a translation 3 units up*
(*d*) *a reflection about the y-axis and a translation 3 units down*

12. *The domain of* $f(x) = \sqrt{2-\sqrt{x}}$ *is*

(*a*) $[0,\infty)$ (*b*) $(-\infty,4]$ (*c*) $[0,4]$ (*d*) $[0,2]$

13. *The graph of* $f(x) = x^2 + x$ *is obtained from the graph of* $g(x) = x^2 - 3x + 1$ *by the two translations :*

(*a*) *Two units to the left and one unit up*
(*b*) *Two units to the right and one unit down*
(*c*) *Two units to the left and one unit down*
(*d*) *Two units to the right and one unit up*

14. *The function* $f(x) = \dfrac{x-5}{|x|-5}$ *has removable discontinuity at*

(*a*) $x = 5, x = -5$ (*b*) $x = 5$ (*c*) $x = -5$ (*d*) *none*

15. $\lim\limits_{x\to 2} \dfrac{\frac{1}{x}-\frac{1}{2}}{2-x}$ *is*

(*a*) $+\infty$ (*b*) $-\dfrac{1}{4}$ $\boxed{(c)\ \dfrac{1}{4}}$ (*d*) *does not exist*

16. $\lim\limits_{x\to\infty} \dfrac{x^2-5}{x^3}$ *is*

(*a*) $-\infty$ (*b*) $+\infty$ $\boxed{(c)\ 0}$ (*d*) *does not exist*

17. *The graph of the curve* $x^2 - 5 = y^2$ *is symmetric about the*

(*a*) *origin only* (*b*) *x-axis only* (*c*) *y-axis only* (*d*) *origin, x-axis, and y-axis*

18. *The parametric equations of the circle* $x^2 + y^2 = 16$ *drawn counter clockwise are*

(*a*) $x = -4\cos t$, $y = 4\sin t$ $0 \le t \le 2\pi$
(*b*) $x = 4\cos t$, $y = 4\sin t$ $0 \le t \le 2\pi$
(*c*) $x = 4\cos t$, $y = -4\sin t$ $0 \le t \le 2\pi$
(*d*) *none*

Good luck

6. A point is moving along the curve $y = \sqrt{x^3+1}$ such that its x-coordinate is decreasing [illegible] cm/s, then the distance between that point and the point (2,0) at the instant $x = 2$ is changing at the rate of:

(a) -2 cm/s (b) 2 cm/s (c) $\frac{8}{3}$ cm/s (d) $-\frac{8}{3}$ cm/s

* Use the function $f(x) = x^{\frac{2}{3}} - x^{\frac{1}{3}}$ to answer the questions 7 – 9:

7. The graph of f has a relative extrema at :

(a) $x = 0$ and $x = \frac{1}{8}$ (b) $x = \frac{1}{2}$ only (c) $x = 0$ and $x = \frac{1}{2}$ (d) $x = \frac{1}{8}$

8. The graph of f has an inflection point at:

(a) $x = 1$ only (b) $x = \frac{1}{2}$ only (c) $x = 0$ and $x = 1$ (d) $x = 0$ only

9. At $x = 0$, the graph of f has:

(a) a vertical tangent line (b) a cusp point

(c) a relative minimum (d) a stationary point

10. Let $f(x) = |\sin x|$. Then: $f'\left(-\frac{\pi}{6}\right) =$

(a) $\sqrt{3}$ (b) $\frac{1}{2}$ (c) $\frac{\sqrt{3}}{2}$ (d) $-\frac{\sqrt{3}}{2}$

11. Let $y = x^{5/3} - x^{2/3}$. Then the differential of y at $x = 1$ with $dx = 0.01$ is:

(a) 0 (b) 0.01 (c) 1.01 (d) $(1.01)^{5/3} - (1.01)^{2/3}$

12. The equation $x^4 + 8 = 10x^2$ has:

(a) at most one solution in the interval $[-4, 4]$.

(b) exactly one solution in the interval $[-4, 4]$.

(c) at least two solutions in the interval $[-4, 4]$.

(d) no solution in the interval $[-4, 4]$.

اسم الطالب:....

الرقم الجامعي: | . | . | | | | | | |

الرقم المتسلسل:....

موعد المحاضرة:....

اسم مدرس المادة:....

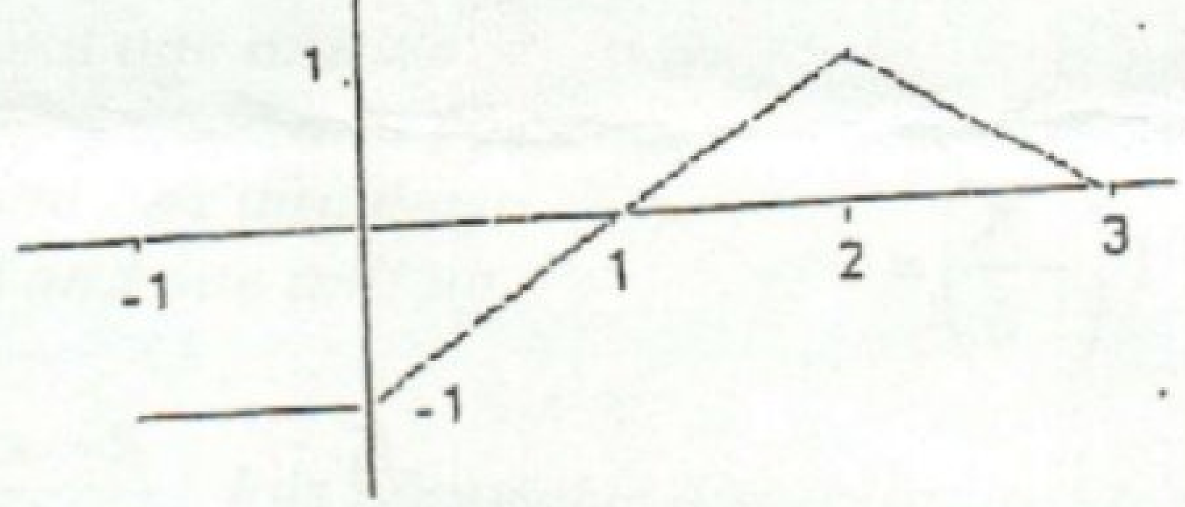
...ect the best correct answer and fill it in the following table: (2.5 points each)

	1	2	3	4	5	6	7	8	9	10
(a)										
(b)										
(c)										
(d)										

1. The amplitude and the period for the equation $2y = -4\sin\left(\frac{x}{2}+2\right)$ respectively, are:

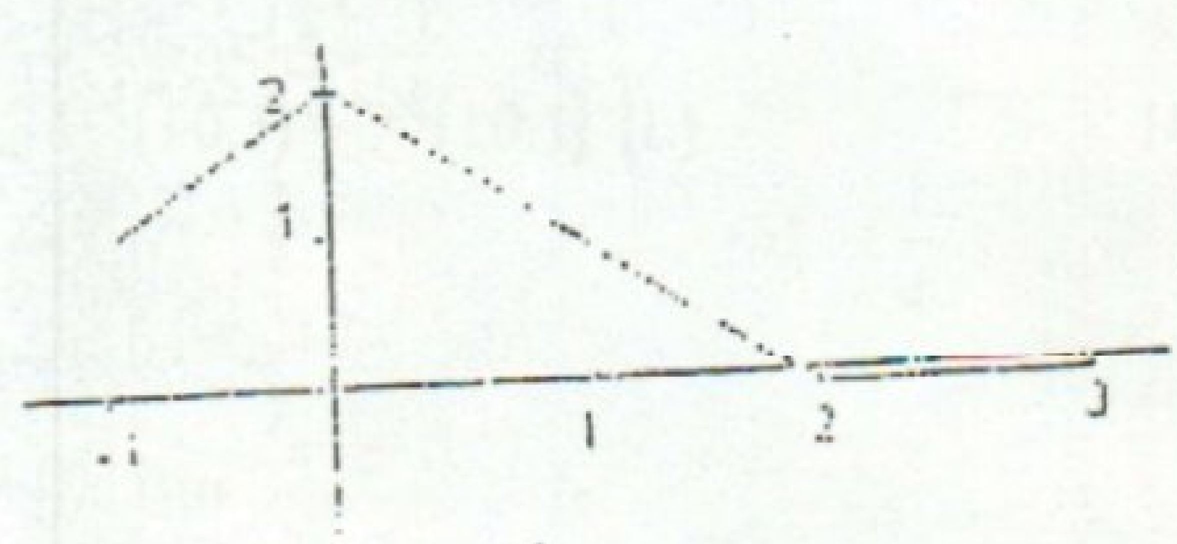
(a) $-2, 4\pi$ (b) $2, 4\pi$ (c) $-4, 4\pi$ (d) $4, 4\pi$.

2. Consider the graph of $y = f(x)$ as shown in the figure

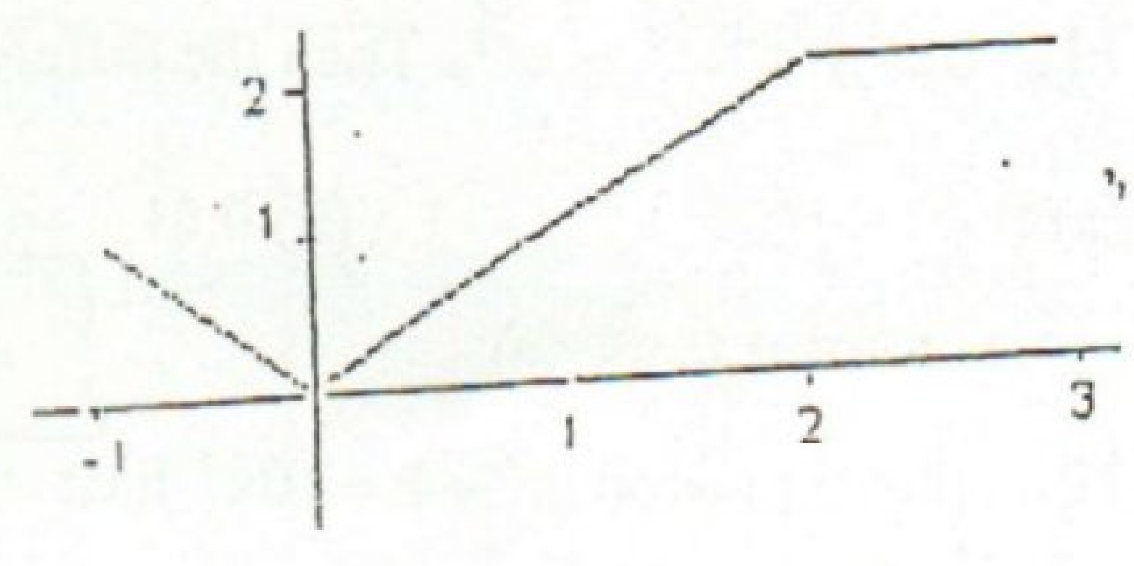


Then the graph of $y = 1 - f(2-x)$ is:

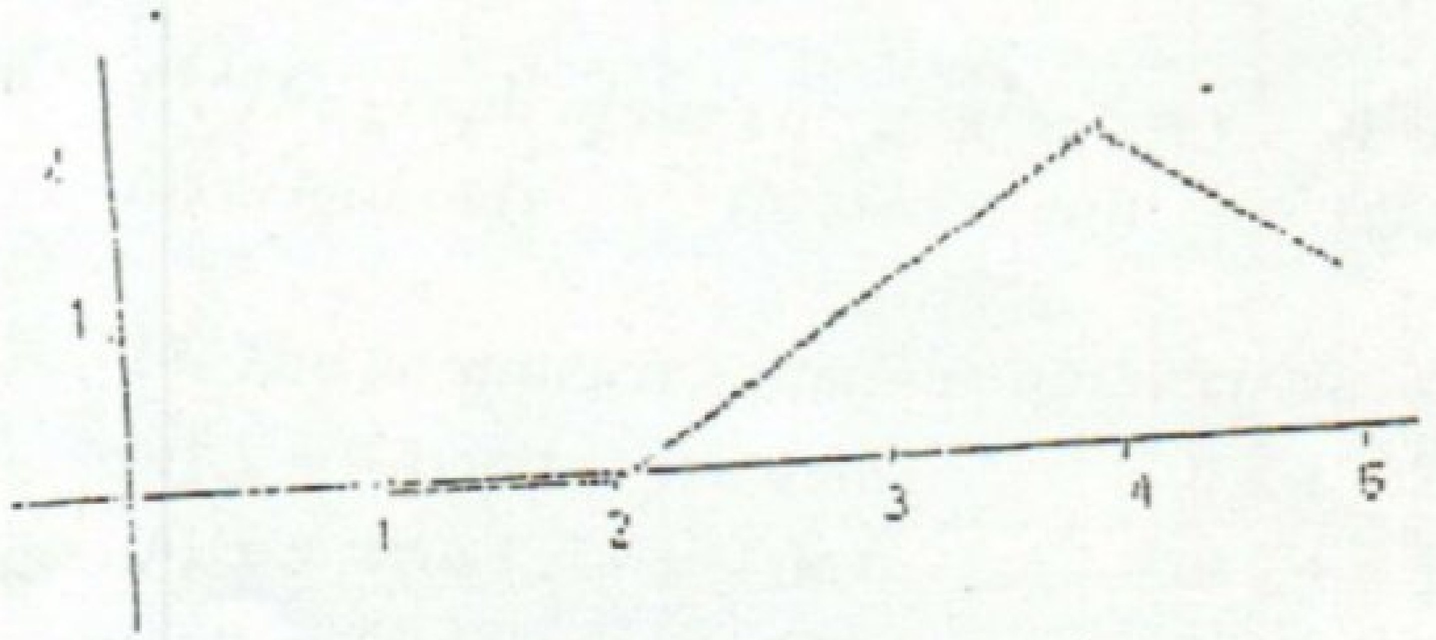
(a)



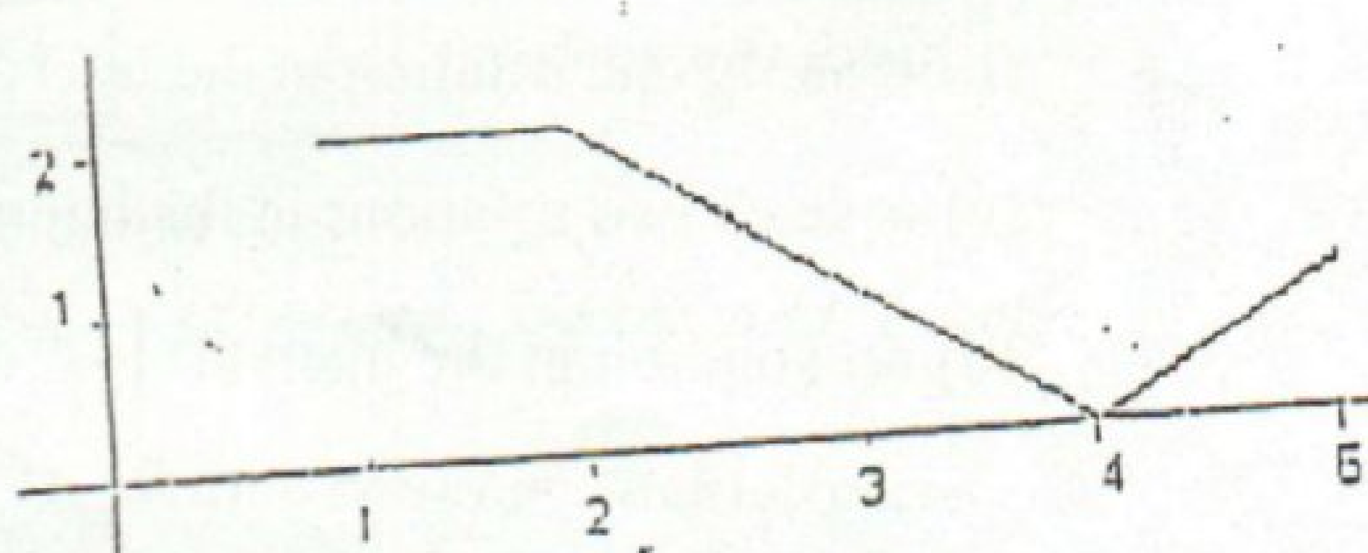
(b)



(c)



(d)



Form D

الرقم الجامعي: اسم الطالب: ....

اسم مدرس المادة: .... موعد المحاضرة: .... الرقم المتسلسل:

Select the best correct answer and fill it in the following table: (2 points each / 25 point max)

	1	2	3	4	5	6	7	8	9	10	11	12	13
(a)							ص		ص	ص			
(b)								ص				ص	ص
(c)			ص	ص							ص		
(d)	ص	ص			ص	ص							

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

(a) ∞ (b) $-\infty$ (c) 0 (d) $\frac{1}{2}$

2. $\lim_{x \to 1^+} \frac{|x^2 - 1|}{|x| - 1} =$

(a) ∞ (b) $-\infty$ (c) 2 (d) -2

3. If $\lim_{x \to 1} \frac{x^2 + x - a}{x - 1}$! where a,b are real numbers then:

(a) $a = 1, b = 1$ (b) $a = 2, b = 1$ (c) $a = 2, b = 3$ (d) $a = -2, b = 3$

4. If $\lim \frac{\sqrt{x^2 + x - 1}}{kx^n + 1} = -1$ then

(a) $n = 2, k = 1$ (b) $n = 2, k = -1$ (c) $n = 1, k = 1$ (d) $n = 1, k = -1$

5. Let $f(x) = \begin{cases} 2cx - dx^2, & x < 2 \\ 12, & x = 2 \\ dx^2 + cx, & x > 2 \end{cases}$

If $\lim_{x \to 2} f(x) = f(2)$ then

(a) $c = 2, d = 2$ (b) $c = 1, d = 4$ (c) $c = 2, d = 4$ (d) $c = 4, d = 1$

6. If f is an odd function, g is an even function then :

(a) $f \circ g$ is an odd function.

(b) $g \circ f$ is an odd function.

(c) $g \circ g$ is an odd function.

(d) $f \circ f$ is an odd function.

(a) $y=\sqrt{13-3x}$ (b) $y=\sqrt{1-3x}$ (c) $y=\sqrt{5-3x}$ (d) $y=\sqrt{9-3x}$

8. The range of the function $\sqrt{4-\sqrt{x}}$ is :

(a) $(0,2)$ (b) $[0,2]$ (c) $[2,\infty)$ (d) $(-\infty,2]$

9. The equation of the line that is perpendicular to the line $x+3y=4$ and its y-intercept 1 is:

(a) $y=1+3x$ (b) $y=1-3x$ (c) $y=1+\frac{x}{3}$ (d) $y=1-\frac{x}{3}$

10. The amplitude of the function $f(x)=5-3\sin(2x-\pi)$ is:

(a) 3 (b) -3 (c) 2 (d) 5

11 The function $y=\frac{2x}{x^4+1}$

(a) has a graph that is symmetric about the x-axis.
(b) has a graph that is symmetric about the y-axis.
(c) has a graph that is symmetric about the origin.
(d) is neither even nor odd.

12. The curve with parametric equations $x=\sec t$, $y=\tan t$, $\frac{-\pi}{2}<t<\frac{-\pi}{2}$ is given by:

(a) $x-\sqrt{1-y^2}$ (b) $x-\sqrt{1+y^2}$ (c) $y+\sqrt{1-x^2}$ (d) $y-\sqrt{1+x^2}$

13. If $f(x)=\frac{1}{\sqrt{x-1}}$, $g(x)=\frac{1}{\sqrt{1-x}}$ then the domain of the function $f\circ g$ is:

(a) $(-1,1)$ (b) $(0,1)$ (c) $(-\infty,1)$ (d) $(1,\infty)$

$f(x) = 1/(x+1)$ on $[-\frac{1}{2}, 1]$? If so , find the appropriate value of the number c.

(4points)

Question (8): Sketch the graph of $y = \dfrac{x^2}{x^2 - x - 2}$ and identify the exact location of all relative extrema , inflection points , where the graph is increasing , decreasing, concave up, concave down, and the asymptotes if any exist. .

(8 points)

(1) The domain of the function $f(x) = \frac{x^2-16}{x-4}$ is:

(a) $\mathbb{R}-\{\pm 4\}$ (b) $\mathbb{R}-\{4\}$ (c) $\mathbb{R}-\{0\}$ (d) $\mathbb{R}-\{-4\}$ (e) $\mathbb{R}$

(2) The domain of the function $g(x) = \sin^{-1}(2x-5)$ is:

(a) $\mathbb{R}$ (b) $[4,6]$ (c) $[-3,-2]$ (d) $[2,3]$ (e) $[-1,1]$

(3) The range of the function $f(x) = \sqrt{3x+5} - 2$ is:

(a) $[-2,\infty)$ (b) $[0,\infty)$ (c) $(-2,\infty)$ (d) $(-\infty,-2]$ (e) $(-\infty,-2)$

(4) The range of the function $f(x) = 3 - 4x - x^2$ is:

(a) $[-2,\infty)$ (b) $(-\infty,-9]$ (c) $(-\infty,7]$ (d) $(-\infty,-2]$ (e) $[7,\infty)$

(5) The exact value of $\log 25 + \log 40$ is:

(a) 3 (b) -3 (c) 2 (d) 10 (e) 100

(6) The exact value of $(\sqrt[3]{e})^{\ln\frac{1}{8}}$ is:

(a) $\frac{1}{8}$ (b) 8 (c) 2 (d) $\ln 2$ (e) $\frac{1}{2}$

(7) Given that $f(x) = c + 3e^{x-1} + x^3$ and $f^{-1}(7) = 1$. Then the value of c is:

(a) 1 (b) -1 (c) 2 (d) 4 (e) 3

(8) The domain of the function $f(x) = \ln(e^x - 2)$ is:

(a) $\mathbb{R}$ (b) $[0,\infty)$ (c) $(0,\infty)$ (d) $(\ln 2,\infty)$ (e) $[\ln 2,\infty)$

(9) If $f(x) = \sqrt{4-x}$ and $g(x) = \sqrt{x}$, then the domain of the function $f \circ g$ is:

(a) $[0,4]$ (b) $[0,16]$ (c) $[4,16]$ (d) $[16,\infty)$ (e) $[0,\infty)$

(10) If $f(x) = \sin x + 2$, $x \in [-\frac{\pi}{2}, \frac{\pi}{2}]$, then $f^{-1}(x) =$

(a) $\sin^{-1}(x-2)$ (b) $\frac{1}{\sin x + 2}$ (c) $(\sin^{-1} x) - 2$ (d) $\sin^{-1} x$ (e) $\sin^{-1}(x+2)$

(11) The **range** of the function $f(x) = \frac{2x^2}{x^2-1}$ is

(a) $\mathbb{R}$ (b) $(0,2)$ (c) $(-\infty,0] \cup (2,\infty)$ (d) $\mathbb{R}-\{0,2\}$ (e) $\mathbb{R}-\{\ln 5\}$

(12) $\sin(2\sin^{-1} 4x) =$

(a) $8x\sqrt{1-16x^2}$ (b) $4x$ (c) $\sqrt{1-16x^2}$ (d) $2\sqrt{1-16x^2}$ (e) $4x\sqrt{1-16x^2}$

(13) $\tan^{-1}(\tan \frac{7\pi}{9}) =$

(a) $\frac{\pi}{9}$ (b) $\frac{7\pi}{9}$ (c) $\frac{2\pi}{9}$ (d) $\frac{-7\pi}{9}$ (e) $\frac{-2\pi}{9}$

(14) The set of **solution** for the equation $(x^2-1)\log_{x+1}(x^2-8)=0$ is:

(a) $\{\sqrt{8}\}$ (b) $\{-3,3\}$ (c) $\{\pm 1, \pm 3\}$ (d) $\{3\}$ (e) $\{\pm\sqrt{8}\}$

(15) The **vertical asymptote** for the function $f(x) = \frac{x-4}{|x|-4}$

(a) *No vertical asymptote* (b) $x = 0$ (c) $x = 4$ (d) $x = \pm 4$ (e) $x = -4$

(16) Let $f(x) = \begin{cases} \frac{\sqrt{4x+1}-3}{x-2}, & x < 2 \\ \frac{x^2}{4} - c, & x \geq 2 \end{cases}$ Then the value of the **constant c** such that $\lim_{x\to 2} f(x)$ exist is:

(a) $\frac{5}{3}$ (b) 1 (c) 0 (d) $\frac{7}{3}$ (e) 2

(17) One of the following functions has ***only one* vertical asymptote**

(a) $\sin x$ (b) $\ln x$ (c) e^x (d) x^3 (e) $\tan x$

(18) One of the following functions is ***odd* function**

(a) $\cos x$ (b) x^2 (c) e^x (d) $\cos^{-1} x$ (e) $\sin x$

(19) One of the following functions is ***one – to – one* function**

(a) e^x (b) $\cos x$ (c) $\sin x$ (d) $\tan x$ (e) $\frac{1}{x^2}$

(20) The **range** of the function $f(x) = \frac{5}{1+2|\sin x|}$ is:

(a) $[-1,1]$ (b) $[0,1]$ (c) $[\frac{5}{3},5]$ (d) $[\frac{1}{5},\frac{1}{3}]$ (e) $[1,3]$

Good luck

حل فيرست
calculus 1

1-) find dom $f(x) = \dfrac{x^2-16}{x-4}$

$Df = \mathbb{R} \cap \mathbb{R} - \{x-4=0\}$

$\boxed{Df = \mathbb{R} - \{4\}}$ (b)

(2) find dom $g(x) = \sin^{-1}(2x-5)$

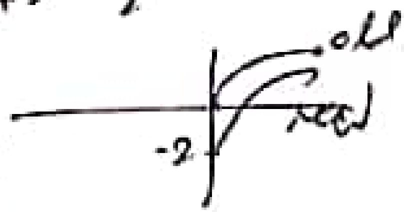
$-1 \leq 2x-5 \leq 1 \quad \boxed{+5}$

$4 \leq 2x \leq 6 \quad \boxed{\div 2}$

$2 \leq x \leq 3 \qquad Dom = [2,3]$ (d)

(3) Range $f(x) = \sqrt{3x+5} - 2$

$Range = [-2, \infty)$ (a)



(4) Range $f(x) = 3 - 4x - x^2$ مرتب

$f(x) = -x^2 - 4x + 3$

للأسفل

الرأس

$\left(\dfrac{-b}{2a}, f\left(\dfrac{-b}{2a}\right)\right)$

$\left(\dfrac{4}{-2}, f(-2)\right)$

$f(-2) = -4 + 8 + 3 = \boxed{7}$

$Range = (-\infty, 7]$ (C)

5-) $\log_{10} 25 + \log_{10} 40 = x$

$\log_{10} 1000 = x$ $\quad 10^x = 1000$

$\boxed{x = 3}$ a

6-) $(\sqrt[3]{e})^{\ln \frac{1}{8}}$

$= (e^{1/3})^{\ln 1/8}$ نضرب الأسس

ثم نبدل

$= e^{\frac{1}{3}\ln 1/8}$ $= e^{\ln \sqrt[3]{\frac{1}{8}}}$

$= \boxed{\frac{1}{2}}$ e

7) $f(x) = c + 3e^{x-1} + x^3$ $\quad f^{-1}(7) = 1$ العكس f

$\boxed{f(1) = 7}$ find(c)?

$7 = c + 3e^0 + 1$

$7 = c + 4$ $\quad \boxed{c = 3}$ e

8) dom $f(x) = \ln(e^x - 2)$

دومين اللوغ ما داخله > صفر

$e^x - 2 > 0$ $\quad e^x > 2$ بالعكس

$x > \ln 2$

$(\ln 2, \infty)$ d

(9) $f(x) = \sqrt{4-x}$ $\quad g(x) = \sqrt{x}$ $\quad$ Dom $f \circ g$?

$\text{Dom} = (-\infty, 4]$ $\qquad \text{Dom} = [0, \infty)$

$$\text{Dom } f \circ g = \{x \in D_g \,;\, g(x) \in D_f\}$$

$$= \{x \in [0, \infty) \,;\, \sqrt{x} \in (-\infty, 4]\}$$

$\sqrt{x} \leq 4$ نربع

$\boxed{x \leq 16}$

$$= \{x \in [0, \infty) \cap x \leq 16\}$$

$\text{Dom} = [0, 16]$ (b)

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(10) $f(x) = \sin x + 2$ find $f^{-1}(x)$?

$y = \sin x + 2$

$y - 2 = \sin x$ $\qquad \sin^{-1}$ للطرفين

$x = \sin^{-1} y - 2$

$f^{-1}(x) = \sin^{-1}(x-2)$ (a)

11) Range $f(x) = \dfrac{2e^x}{e^x - 5} = ?$

Rule: $Dom f^{-1} = Range f$

$$y = \frac{2e^x}{e^x - 5} \Rightarrow ye^x - 5y = 2e^x$$

$$ye^x - 2e^x = 5y$$

$$\frac{e^x\cancel{(y-2)}}{\cancel{y-2}} = \frac{5y}{y-2}$$

$$e^x = \frac{5y}{y-2} \Rightarrow x = \ln\frac{5y}{y-2}$$

$$f^{-1}(x) = \ln\frac{5x}{x-2}$$

Dom: $\dfrac{5x}{x-2} > 0$

البسط $- \; - \; - \; 0 \; + \; + \; +$

المقام $- \; - \; - \; - \; - \; 2 \; + \; +$

بسط/مقام $+ \; + \; 0 \; - \; 2 \; +$

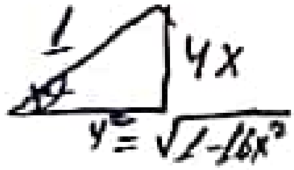
$Dom f^{-1} = (-\infty, 0) \cup (2, \infty) = Range f$

(C)

12-) $\sin(2\sin^{-1}4x) = ?$

$\theta = \sin^{-1}4x$

$\sin\theta = \frac{4x}{1}$ مقابل / وتر



$1 = 16x^2 + y^2$

$y = \sqrt{1-16x^2}$ ⇒ اكملي $\sin 2\theta = 2\sin\theta\cos\theta$

$= 2 \cdot \frac{4x}{1} \cdot \frac{\sqrt{1-16x^2}}{1}$

$= 8x\sqrt{1-16x^2}$

a

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13 $\tan^{-1}(\tan\frac{7\pi}{9})$

$\frac{9\pi}{9} - \frac{7\pi}{9} = \boxed{\frac{2\pi}{9}}$

Tan(−)
بالربع ٢

$= \tan^{-1}(-\tan\frac{2\pi}{9}) = -\tan^{-1}(\tan\frac{2\pi}{9}) = \frac{-2\pi}{9}$ c

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14 $(x^2-1)\log_{x+3}{x^2-8} = 0 \Rightarrow x = +1$ ✗

$x = -1$ ✗

$x = 3$ ✓

$\log_{x+3}{x^2-8} = 0 \Rightarrow x^2-8 = 1$ $x = -3$ ✗

$x^2 = 9$

$x = \pm 3$ $\boxed{x = 3}$ d

5

15) V.asy for $f(x) = \dfrac{x-4}{|x|-4}$ $\leftrightarrow$ $=0$

$\boxed{x = \pm 4}$

$f(4) = \frac{0}{0}$ ✗

$f(-4) = \frac{-8}{0}$ ✓

at $x=-4$ V.asy (c)

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16) $\lim\limits_{x\to 2} f$ exists $\rightarrow$ $\lim\limits_{x\to 2^+} \dfrac{x^3}{3} - c = \lim\limits_{x\to 2^-} \dfrac{\sqrt{4x+1}-3}{x-2}$

$\downarrow$

ضرب بالمرافقة

$\dfrac{\cancel{x^3}\,8}{3} - c = \lim\limits_{x\to 2^-} \dfrac{4x+1-9}{(x-2)(\sqrt{4x+1}+3)}$

$\dfrac{\cancel{x^3}\,8}{3} - c = \lim\limits_{x\to 2^-} \dfrac{4\cancel{(x-2)}}{\cancel{(x-2)}(\sqrt{4x+1}+3)}$

$\dfrac{\cancel{x^3}\,8}{3} - c = \dfrac{4}{6}$

$c = \dfrac{\cancel{x^3}\,8}{3} - \dfrac{2}{3}$

$c = \dfrac{6}{3}$

$\boxed{c = 2}$ (c)

---

(17) one has only 1 v.asy

sinx ✗ lnx ✓ e^x ✗ H.asy x^3 ✗ ~~cos x~~ tanx ✗ ~~sec x~~ ✗

ans is lnx (b)

---

(18) whose odd?!

cos x ✗ x^2 ✗ e^x ✗ $\cos^{-1}x$ ✗ sinx ✓

ans is (e)

---

(19) whose one to one?

e^x ✓ cosx ✗ sinx ✗ tanx ✗ $\frac{1}{x^2}$ ✗

(d)

---

(20) Range $f(x) = \frac{5}{1+2|\sin x|}$

$0 \le |\sin x| \le 1$ $\boxed{\cdot 2}$

$0 \le 2|\sin x| \le 2$ $\boxed{+1}$

$1 \le 2|\sin x|+1 \le 3$ $\boxed{1/}$

$\frac{1}{3} \le \frac{1}{2|\sin x|+1} \le 1$ $\boxed{\cdot 5}$

$\frac{5}{3} \le \frac{5}{2|\sin x|+1} \le 5$

Range $= [\frac{5}{3}, 5]$

(c) #

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