Name:______________________________________

								$Math - 132$ $Term - 093$ $SUMTW$ $10:30\ am$	$Section\ 01$ $11:30\ am$

$CODE$ $001*$	$CODE$ 002	$CODE$ 003	$CODE$ 004	$MARKS: 126$ $Time: 2Hours$	$SERIAL$ $Number$		

NOTE: 1. The questions are not in any order of difficulty at all.

2. All questions carry equal number of marks.

3. Only the nonprogramable calculators are allowed.

4. All types of PAGERS, OR MOBILES ARE NOT ALLOWED to be with you during the examination.

5. Use an HB 2 pencil.

6. Use a good eraser. Do not use the eraser attached to the pencil.

7. Write your name, ID number and Section number on the examination paper and in the upper left corner of the answer sheet.

8. When bubbling your ID number and Section number, be sure that bubbles match with the number that you write.

9. The test Code Number is already typed and bubbled in your answer sheet. Make sure that it is the same as that printed on your question paper.

10. When bubbling, make sure that the bubbled space is fully covered.

11. When erasing a bubble, make sure that you do not leave any trace of penciling.

12. Count that the Examination has TWENTY-ONE Questions and TWELVE Pages.

13. Please BUBBLE carefully only right answer letter (A or B or C or D or E) corresponding to the correct answer to each question in the enclosed computerized Omar Sheet, with pencil only.

14. Please do not leave any question unbubbled in the Answer Sheet.

15. Please check that the version of your question paper and the answer sheet enclosed with it matches correctly. The versions are Code: 001, Code: 002, Code: 003, Code: 004.

1Q1. Find the integral

$$\int \frac{xdx}{(7x^2+3)^5}.$$

$(A) \longrightarrow -\frac{1}{56}(7x^2+3)^{-4}+C$

$(B) \longrightarrow -\frac{1}{14}(7x^2+3)^{-6}+C$

$(C) \longrightarrow -\frac{7}{3}(7x^2+3)^{-6}+C$

$(D) \longrightarrow -\frac{7}{3}(7x^2+3)^{-4}+C$

$(E) \longrightarrow -\frac{1}{56}\left(\frac{7}{3}x^3+3x\right)^{-4}+C$

==

2Q2. Find the coordinates of the points of $inflection$ for the function.

$f(x) = x^3 + 9x^2 + 24x + 18$

$(A) \longrightarrow (-2, -2)$

$(B) \longrightarrow (-4, 2)$

$(C) \longrightarrow (-3, 0)$

$(D) \longrightarrow (0, 18)$

$(E) \longrightarrow$ *There are no points of inflection.*

==

3Q3. The function $y = 4x^3 - 10x^2 - 8x + 3$ is decreasing on

$(A) \longrightarrow \left(-\frac{1}{3},\ 2\right)$

$(B) \longrightarrow \left(-\infty,\ -\frac{1}{3}\right)$

$(C) \longrightarrow (2,\ \infty)$

$(D) \longrightarrow \left(-\frac{1}{3},\ \infty\right)$

$(E) \longrightarrow (-\infty,\ 2)$

==

4Q4. On the interval $[0, 2]$, the function $y = 3x^4 - 4x^3$ has

$(A) \longrightarrow$ an absolute minimum at $x = 1$ and no absolute maximum.

$(B) \longrightarrow$ an absolute maximum at $x = 0$ and an absolute minimum at $x = 1$.

$(C) \longrightarrow$ an absolute maximum at $x = 2$ and an absolute minimum at $x = 1$.

$(D) \longrightarrow$ an absolute maximum at $x = 2$ and an absolute minimum at $x = 0$.

$(E) \longrightarrow$ no absolute maximum and no absolute minimum.

==

5Q5. If $f(x) = x^3 + 3x^2 - 24x + 8$, then f is

$(A) \longrightarrow$ decreasing on $(-\infty,\ 2)$, concave up on $(-1,\ \infty)$, and has no relative minimum point.

$(B) \longrightarrow$ decreasing on $(1,\ 2)$, concave up on $(0,\ \infty)$, and has a relative minimum when $x = -\ 4$.

$(C) \longrightarrow$ increasing on $(2,\ \infty)$, concave up on $(-\ \infty,\ -\ 1)$, and has a relative minimum when $x = 2$.

$(D) \longrightarrow$ increasing on $(-\ 4,\ 2)$, concave down on $(-\ \infty,\ \infty)$, and has a relative maximum when $x = 2$.

$(E) \longrightarrow$ decreasing on $(-\ 4,\ 2)$, concave down on $(-\ \infty, -\ 1)$, and has a relative maximum when $x = -\ 4$.

==

6Q6. The cost equation for a cookie store is given by $C(x) = 2x^3 - 21x^2 + 60x + 500$, where x is the number of cookies made (in dozens), and $C(x)$ is the cost in dollars.

Determine where the graph of the equation is concave up and where it is concave down and find any $inflection$ points.

$(A) \longrightarrow$ The graph of the equation is concave down when $x < \dfrac{7}{2}$ and is concave up when $x > \dfrac{7}{2}$, and there is a point of $inflection$ when $x = \dfrac{7}{2}$.

$(B) \longrightarrow$ The graph of the equation is concave down for all values of x, and there is no point of $inflection$.

$(C) \longrightarrow$ The graph of the equation is concave up for all values of x, and there is no point of $inflection$.

$(D) \longrightarrow$ The graph of the equation is concave down when $x > \dfrac{7}{2}$ and is concave up when $x < \dfrac{7}{2}$, and there is a point of $inflection$ when $x = \dfrac{7}{2}$.

$(E) \longrightarrow$ None of the above statements is true.

==

7Q7. If $f''(x) = x(x+1)(x-2)^2$, then the graph of f has *inflection* points when $x =$

$(A) \longrightarrow -1$ only

$(B) \longrightarrow 2$ only

$(C) \longrightarrow -1$ and 0 only

$(D) \longrightarrow -1$ and 2 only

$(E) \longrightarrow -1,\ 0,$ and 2 only

==

8Q8. A rectangular plot adjacent to a stream is to be fenced in by using the stream as one side of the enclosed area.

If 2000 feet of fencing are to be used, find the maximum area that can be enclosed.

Assume the answer is in square feet.

$(A) \longrightarrow 400000$

$(B) \longrightarrow 500000$

$(C) \longrightarrow 600000$

$(D) \longrightarrow 800000$

$(E) \longrightarrow 250000$

==

9Q9. $\displaystyle\int_2^3 \frac{x\,dx}{x^2+1} =$

$(A) \longrightarrow \frac{1}{2}\ln\frac{3}{2}$

$(B) \longrightarrow \frac{1}{2}\ln 2$

$(C) \longrightarrow \ln 2$

$(D) \longrightarrow 2\ln 2$

$(E) \longrightarrow \frac{1}{2}\ln 5$

==

10Q10. $\displaystyle\int_0^1 (x+1)\,e^{x^2+2x}dx =$

$(A) \longrightarrow \frac{e^3}{2}$

$(B) \longrightarrow \frac{e^3-1}{2}$

$(C) \longrightarrow \frac{e^4-e}{2}$

$(D) \longrightarrow e^3-1$

$(E) \longrightarrow e^4-e$

==

11Q11. Given the function defined by $f(x) = 3x^5 - 20x^3$, find all values of x for which the graph of f is concave up.

$(A) \longrightarrow x > 0$

$(B) \longrightarrow -\sqrt{2} < x < 0$ or $x > \sqrt{2}$

$(C) \longrightarrow -2 < x < 0$ or $x > 2$

$(D) \longrightarrow x > \sqrt{2}$

$(E) \longrightarrow -2 < x < 2$

==

12Q12. The number of bacteria in a culture is growing at a rate of $3000e^{\frac{2t}{5}}$ per unit of time.

At $t = 0$, the number of bacteria present was 7500.

Find the number present at $t = 5$.

$(A) \longrightarrow 1200e^2$

$(B) \longrightarrow 3000e^2$

$(C) \longrightarrow 7500e^2$

$(D) \longrightarrow 7500e^5$

$(E) \longrightarrow \dfrac{15000}{7}e^7$

==

13Q13. What are all values of x for which the function f defined $f(x) = x^3 + 3x^2 - 9x + 7$ is increasing?

$(A) \longrightarrow -3 < x < 1$

$(B) \longrightarrow -1 < x < 1$

$(C) \longrightarrow x < -3$ or $x > 1$

$(D) \longrightarrow x < -1$ or $x > 3$

$(E) \longrightarrow$ *All* real *numbers.*

===

14Q14. The radius r of a sphere is increasing at the uniform rate of $\dfrac{dr}{dt} = 0.3$ inches per second. At the instant when the surface area S becomes 100π square inches.

What is the rate of increase, in cubic inches per second, in the volume V? $\dfrac{dV}{dt} =$

$\left(S = Surface\ Area = 4\pi r^2\ and\ \text{Volume} = V = \dfrac{4}{3}\pi r^3\right).$

$(A) \longrightarrow 10\ \pi$

$(B) \longrightarrow 12\ \pi$

$(C) \longrightarrow 22.5\ \pi$

$(D) \longrightarrow 25\ \pi$

$(E) \longrightarrow 30\ \pi$

===

15Q15. The demand equation for a monopolist's product is $p = \dfrac{500}{\sqrt{q}}$, where p is the price per unit (in dollars) for q units. If the total cost c (in dollars) of producing q units is given by $c = 5q + 2000$, then the level of production at which profit is maximized is

$[Hint : \mathrm{Re}\,venue = \ R = qp; \ \mathrm{Pr}\,ofit = P = R - c = \mathrm{Re}\,venue - Cost]$

$(A) \longrightarrow$ 100 units

$(B) \longrightarrow$ 10000 units

$(C) \longrightarrow$ 900 units

$(D) \longrightarrow$ 1600 units

$(E) \longrightarrow$ 2500 units

==

16Q16. The supply equation for a certain radio is given by $p = p(x) = 0.8\sqrt{x} + 17$ where p is the price in dollars and x is the number of radios supplied.

Use differentials only to approximate the price when 620 radios are supplied. $(Hint : Use\ x = 625.)$

$[p(x + dx) \approx p(x) + dp; \ dp = p'(x)\,dx]$

$(A) \longrightarrow$ $approximately$ 36.92 $dollars$

$(B) \longrightarrow$ $approximately$ 37.00 $dollars$

$(C) \longrightarrow$ $approximately$ 37.08 $dollars$

$(D) \longrightarrow$ $approximately$ 36.98 $dollars$

$(E) \longrightarrow$ $approximately$ 36.84 $dollars$

==

17Q17. The exact area of the region bounded by the graphs of $y = x^2 + x + 1$, $x = -\ 2$, $x = 1$, and the $x - axis$ is

$(A) \longrightarrow \frac{5}{2}$ $square\ units$

$(B) \longrightarrow \frac{7}{2}$ $square\ units$

$(C) \longrightarrow \frac{9}{2}$ $square\ units$

$(D) \longrightarrow \frac{11}{2}$ $square\ units$

$(E) \longrightarrow \frac{13}{2}$ $square\ units$

==

18Q18. The exact area of the region bounded by the graphs of $y = x^2 - 5$ and $y = 2x + 3$ is

$(A) \longrightarrow \frac{9}{2}$ $square\ units$

$(B) \longrightarrow 36$ $square\ units$

$(C) \longrightarrow 60$ $square\ units$

$(D) \longrightarrow 24$ $square\ units$

$(E) \longrightarrow \frac{73}{3}$ $square\ units$

==

19Q19. Find all the horizontal and vertical asymptotes of the following function $f(x)$.

$$f(x) = \frac{x^2}{x^2 + 2x - 5}.$$

Then which one of the following statements is true.

(A) Exactly one horizontal asymptote and exactly one vertical asymptote.

(B) No horizontal asymptote and no vertical asymptote.

(C) Exactly one horizontal asymptote and exactly two vertical asymptotes.

(D) Exactly two horizontal asymptotes and exactly one vertical asymptote.

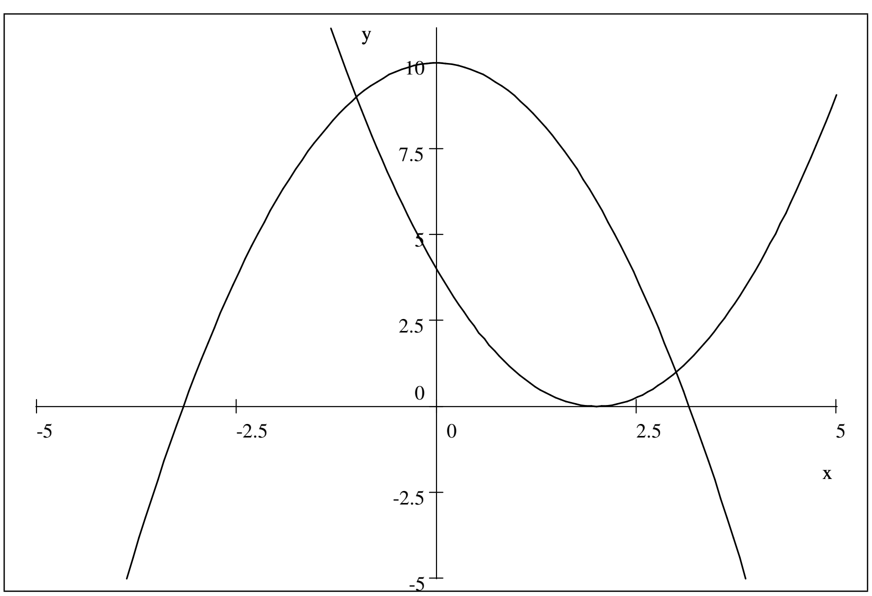
(E) Exactly two horizontal asymptotes and exactly two vertical asymptote.

==

20Q20. Find the area of the region that is between the curves

$y = x^2 - 4x + 4$ and $y = 10 - x^2$

from $x = 2$ $\ to\ $ $x = 4$.



$(A) \longrightarrow 4$

$(B) \longrightarrow 8$

$(C) \longrightarrow 12$

$(D) \longrightarrow 16$

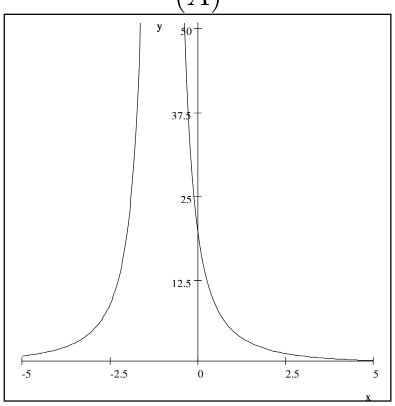
$(E) \longrightarrow 6$

==

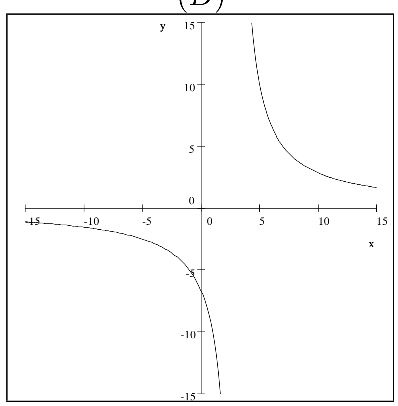
21Q21. A released film has a revenue given by $y(x) = \dfrac{20}{x+3}$, where $y(x)$ is in millions of dollars and x is the number of weeks after its release.

Sketch the graph of this function.

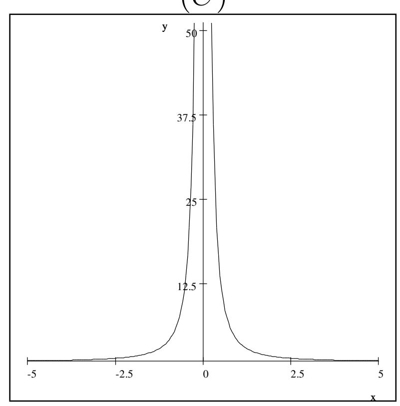
(A)



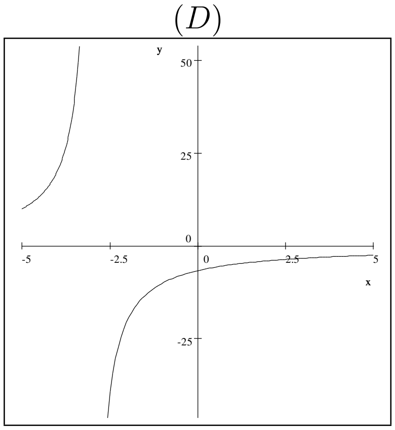
(B)



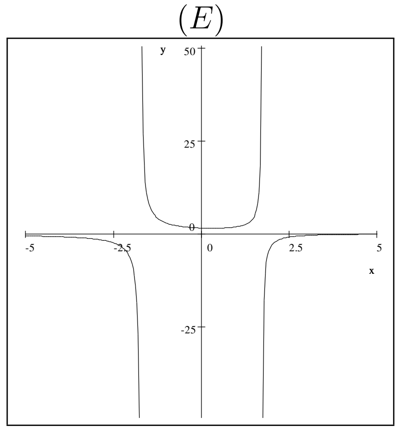
(C)



(D)



(E)



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MATH-132-093-EXAM-II

Qn#	A	B	C	D	E	Letter
1	$\surd$					A
2			$\surd$			C
3	$\surd$					A
4			$\surd$			C
5					$\surd$	E
6	$\surd$					A
7			$\surd$			C
8		$\surd$				B
9		$\surd$				B
10		$\surd$				B
11		$\surd$				B
12			$\surd$			C
13			$\surd$			C
14					$\surd$	E
15					$\surd$	E
16	$\surd$					A
17			$\surd$			C
18		$\surd$				B
19			$\surd$			C
20		$\surd$				B
21	$\surd$					A
Sum						126