MA 1022 B 2017 Basic Skills Exam December 14, 2017

Name _____

Instructions
This test is closed book. Calculators are not allowed. On the basic skills part of the exam only the final answers are graded – it's "all or nothing".

Part I (Basic Skills Test)

Problem	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Total**
Value	5	5	5	5	5	5	5	35
Earned								

Please circle your section

B01Y (Rao, 9:00 lecture)

B02Y (Wu, 9:00 lecture)

B08Y (Malone, 2:00 lecture)

B09Y (Wu, 3:00 lecture)

A B R A H A M

B03Y (conference with Susan)

B04Y (conference with David)

B05Y (conference with Rob)

B06Y (conference with Andrea)

B07Y (conference with Daniela)

Part I (Basic Skills Test) **Name** _____

There is no partial credit on these problems -- only your final answer will be graded. Work carefully and check your work. You need not simplify answers, except that an answer for a definite integral should be simplified as much as possible.

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1. $\int\left(e^{3x}+\frac{1}{\sqrt[3]{x}}-x^{-3}\right)dx$ Ans:_____

2. $\int x\sin(4x)\,dx$ Ans:_____

3. $\int\frac{4x+7}{(x-2)(x-3)}dx$ Ans:_____

4. $\int\frac{1}{x^2+9}dx$ Ans:_____

5. $\int\frac{x}{x^2+9}dx$ Ans:_____

6. $\int_0^{\pi/2}\cos(x)e^{\sin(x)}dx$ Ans:_____

7. $\int\sec^2(x)\tan^3(x)\,dx$ Ans:_____

MA 1022 B 2017 Final Exam December 14, 2017

Name _____

Instructions
This test is closed book. Calculators are not allowed. Show your work in the space provided. On the general part of the exam your work and your explanations are graded, not just the final answers.

Part II (General Exam)

Problem	**8**	**9**	**10**		**11**	**12**						**13**	**Total**
Value	14	14	5	5	12	6	6	6	6	6	6	14	**100**
	⇩	⇩			⇩							⇩	
Earned													

Please circle your section

B01Y (Rao, 9:00 lecture)

B02Y (Wu, 9:00 lecture)

B08Y (Malone, 2:00 lecture)

B09Y (Wu, 3:00 lecture)

A B R A H A M

B03Y (conference with Susan)

B04Y (conference with David)

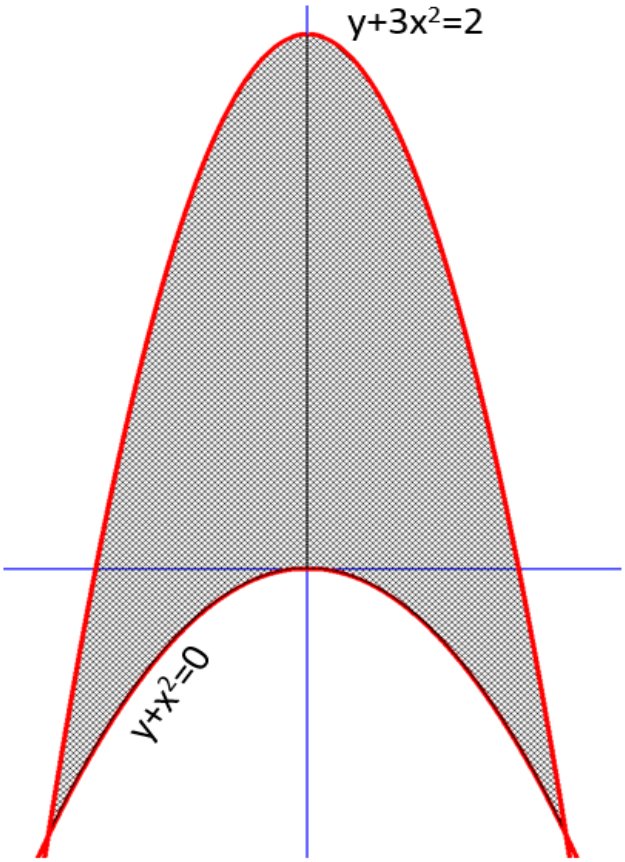
B05Y (conference with Rob)

B06Y (conference with Andrea)

B07Y (conference with Daniela)

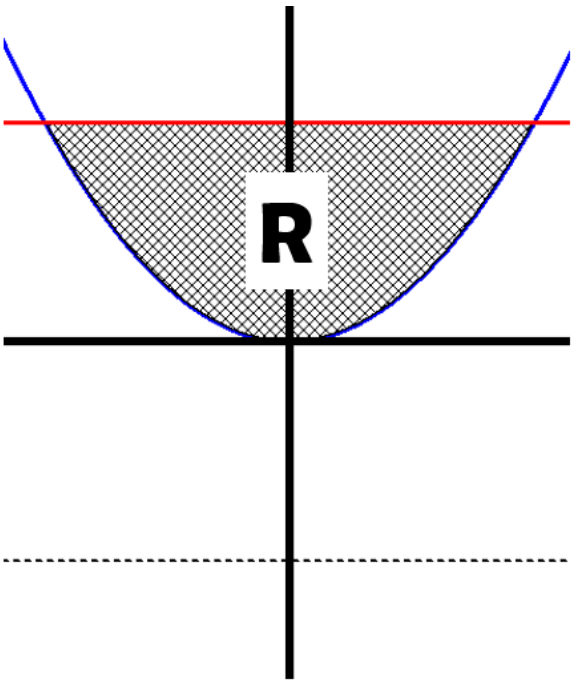
8. The region **R** is bounded between the curves $y+x^2=0$ and $y+3x^2=2$

Calculate the area of the region **R**.



9. The region ***R*** is captured between the curve $y = x^2$ and the line $y = 1$.

Calculate the volume of the solid which results when ***R*** is revolved around the line $y = -1$.



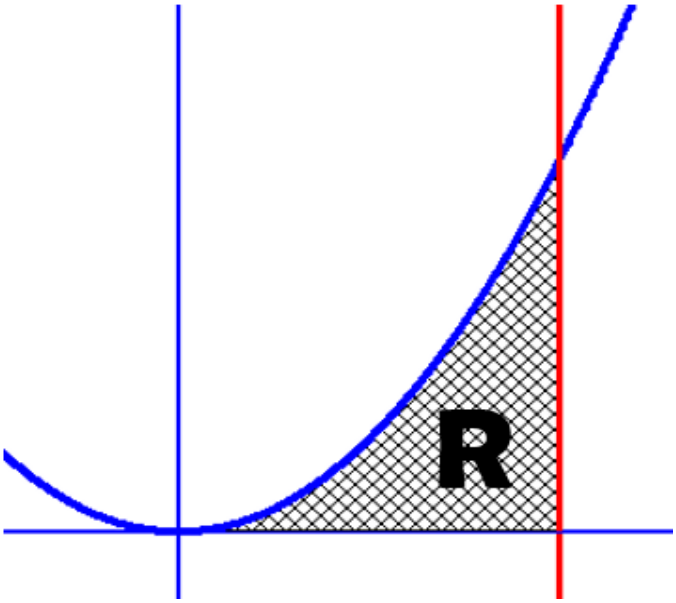
10. **<u>Set up but do not evaluate</u>** an expression for each of the following:

a. The arc length of the curve $y = \ln(x^2)$ between the points $(1,0)$ and $(e,2)$

b. The surface area swept out when the curve $y = \sin(2x)$ between the points $(0,0)$ and $\left(\frac{\pi}{4},1\right)$ is rotated around the $x-axis$

11. The region $\boldsymbol{R}$ is the first quadrant region beneath the curve $y = x^2$ and to the left of the line $x = 2$ (see sketch on the right).

Find the coordinates of the centroid of $\boldsymbol{R}$.



12. Evaluate each of the following integrals. Be sure to show your work; unsupported answers will receive no credit.

a. $\int \cos^6(x)\sin^3(x)\,dx$

b. $\int x \arcsin\left(x^2\right)dx$

c. $\int x^2 e^x dx$

d. $\int \frac{8x+2}{x^3-4x} dx$

e. $\int \frac{e^x}{1+e^x} dx$

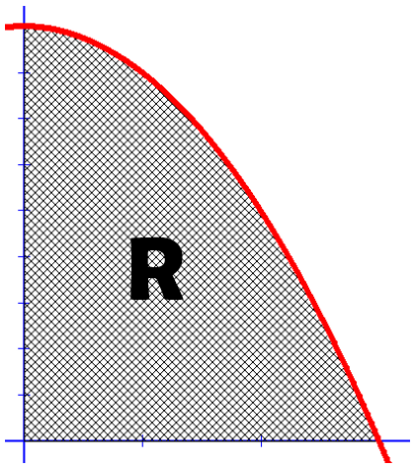
f. $\int \frac{1}{x^2+2x+2} dx$

$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$	$\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$	$\sum_{i=1}^{n} i^3 = \left[\frac{n(n+1)}{2}\right]^2$

13. The region **R** is the first quadrant region beneath $y = 9 - x^2$ (see sketch)

(a) Write a Riemann sum approximating the area of the indicated region by dividing the interval of integration into **n** equal parts, and evaluating the function at the right endpoints of the subintervals.

(b) Using the expression obtained in part (a), let $\mathbf{n} \to \infty$, and determine a numerical value for the integral.



***** ***** ***** ***** ***End of Exam*** ***** ***** ***** *****