

Quiz 1A

1)  $\int \left( t\sqrt{t} + \frac{2}{\sqrt{t}} \right) dt = ?$

2)  $\int \left( \frac{3}{x^2 + 1} - \frac{4}{x} \right) dx = ?$

3)  $\int \left( \frac{1}{2} + \frac{1}{y^{2/3}} \right) dy = ?$

4)  $\int \left( \frac{t^2 + t^4}{\sqrt{t}} \right) dt = ?$

5)  $\int \sin(3x) dx = ?$

Quiz 1B

1)  $\int \cos(t/3) dt = ?$

2)  $\int \left( \sqrt{x} + \frac{3}{x\sqrt{x}} \right) dx = ?$

3)  $\int \left( \frac{4}{z} - \frac{3}{z^2 + 1} \right) dz = ?$

4)  $\int \left( 1/x^{3/4} - 1/3 \right) dx = ?$

5)  $\int \left( \frac{t^4 - t^2}{\sqrt{t}} \right) dt = ?$

Quiz 2A

1)  $\int \frac{1}{t^4} \cos(1/t^3) dt = ?$

2)  $\int 2y\sqrt{1 - 3y^2} dy = ?$

3)  $\int \frac{1}{\sqrt{5x + 4}} dx$

4)  $\int_1^9 \frac{1 - \sqrt{z}}{\sqrt{z}} dz = ?$

Quiz 2B

1)  $\int \frac{1}{\sqrt{3y+2}} dy$

2)  $\int \frac{1}{t^3} \cos(1/t^2) dt = ?$

3)  $\int_1^4 \frac{1+\sqrt{x}}{\sqrt{x}} dx = ?$

4)  $\int 3u\sqrt{1-2u^2} du = ?$

Quiz 3A

1) The values of a function are given by the table: 

$x$	5	8	11	14	17
$f(x)$	32	30	27	23	18

a. Use trapezoidal approximation to estimate  $\int_5^{17} f(x) dx$ .

b. Use Simpson's method to estimate  $\int_5^{17} f(x) dx$ .

2) Calculate  $\int_{-1}^{+1} x^3 \sqrt{x^4 + 1} dx$ .

3) Calculate  $\int_0^{\pi/6} (1 - \sin 3t)^{5/2} \cos 3t dt$ .

4) Find the area of the region that is bounded above by  $y = \sqrt{x}$  and below by the  $x$ -axis and the line  $y = x - 2$ .

Quiz 4A

1) The region bounded by  $y = 2x$  and  $y = x^2$  is revolved around the  $x$ -axis. Find the volume of the resulting solid.

2) The region bounded by  $y = x^2$  and  $y = 9$  is the base of a solid whose cross sections perpendicular to the  $x$ -axis are squares. Express the volume of the resulting solid as a definite integral. Do not evaluate the integral.

3) The region bounded by  $y = 3x$  and  $y = x^2$  is revolved around the  $y$ -axis. Find the volume of the resulting solid.

4) The region bounded by  $y = \sqrt{x}$ ,  $y = 0$ , and  $x = 5$  is revolved around the  $x = 8$ . Express the volume of the resulting solid as a definite integral. Do not evaluate the integral.

### Quiz 4B

- 1) The region bounded by  $y = 2x$  and  $y = x^2$  is revolved around the  $y$ -axis. Find the volume of the resulting solid.
- 2) The region bounded by  $y = \sqrt{x}$ ,  $y = 0$ , and  $x = 3$  is revolved around the  $x = 5$ . Express the volume of the resulting solid as a definite integral. Do not evaluate the integral.
- 4) The region bounded by  $y = 3x$  and  $y = x^2$  is revolved around the  $x$ -axis. Find the volume of the resulting solid.
- 5) The region bounded by  $y = x^2$  and  $y = 4$  is the base of a solid whose cross sections perpendicular to the  $x$ -axis are squares. Express the volume of the resulting solid as a definite integral. Do not evaluate the integral.

### Quiz 5A

- 1) The region bounded by  $y = x^2$  and  $y = 5$  is revolved around the line  $y = 6$ . Express the volume of the resulting solid as a definite integral. Do not evaluate the integral.
- 2) Find the length of the graph of  $y = x^{3/2}$  between  $x = 1$  and  $x = 3$ .
- 3) The region bounded by  $y = 4x^2$  and  $y = 9$  is revolved around the  $y$ -axis to make a tank which is filled with a fluid with density  $\rho$ . The fluid is raised to the level of the top of the tank. Express the work necessary to do this as a definite integral. Do not evaluate the integral.
- 4) A tank is in the shape of an inverted pyramid (apex down) which has height 5 and whose top is 3 by 3 (all length dimensions in feet). It is filled with a fluid of density 40 lbs/ft<sup>2</sup>. How much work is required to raise all the fluid to the level of the top of the tank.

### Quiz 5B

- 1) A tank is in the shape of an inverted pyramid (apex down) which has height 5 and whose top is 2 by 2 (all length dimensions in feet). It is filled with a fluid of density 30 lbs/ft<sup>2</sup>. How much work is required to raise all the fluid to the level of the top of the tank?
- 2) The region bounded by  $y = x^2$  and  $y = 6$  is revolved around the line  $y = 7$ . Express the volume of the resulting solid as a definite integral. Do not evaluate the integral.
- 3) Find the length of the graph of  $y = x^{3/2}$  between  $x = 2$  and  $x = 4$ .
- 4) The region bounded by  $y = 9x^2$  and  $y = 4$  is revolved around the  $y$ -axis to make a tank which is filled with a fluid with density  $\rho$ . The fluid is raised to the level of the top of the tank. Express the work necessary to do this as a definite integral. Do not evaluate the integral.

Quiz 6/7A

- 1) The region  $R$  is bounded by  $y = x^2$  and  $y = x + 2$ .
  - a. Find the area of  $R$ , integrating with respect to  $x$ .
  - b. Find the area of  $R$ , integrating with respect to  $y$ .
- 2) A tank is in the shape of a cone of height 5 and radius 4, with the point up. It is filled with a fluid with density  $\rho$ . Find the work needed to raise all the fluid to the level of the top of the tank.
- 3) The region bounded by  $y = 4$ ,  $x = 0$ , and  $y = 2x$  is revolved around the line  $x = -1$ . Find the resulting volume.
- 4) Find  $\int \frac{5z}{\sqrt{1+2z^2}} dz$ .
- 5) Calculate  $\int_0^2 \frac{x^2}{\sqrt{1+x^3}} dx$ .
- 6) Calculate  $\int_0^1 \frac{1}{\sqrt{9+7y}} dy$ .
- 7) A flat plate in the plane with uniform density  $\rho$  is bounded by  $y = 0$ ,  $x = 2$ , and  $y = x^2$ .
  - a. Find the total mass.
  - b. Find the moment around the  $y$ -axis.
  - c. Find the moment around the  $x$ -axis.
  - d. Find the  $x$ -coordinate of its center of mass.
  - e. Find the  $y$ -coordinate of its center of mass.

Quiz 6/7B

- 1) Calculate  $\int_0^2 \frac{t^2}{\sqrt{1+t^3}} dt$ .
- 2) Calculate  $\int_0^1 \frac{1}{\sqrt{16+9y}} dy$ .
- 3) Find  $\int \frac{3u}{\sqrt{1+4u^2}} du$ .

- 4) A flat plate in the plane with uniform density  $\rho$  is bounded by  $y = 0$ ,  $x = 3$ , and  $y = x^2$ .
- Find the total mass.
  - Find the moment around the  $y$ -axis.
  - Find the moment around the  $x$ -axis.
  - Find the  $x$ -coordinate of its center of mass.
  - Find the  $y$ -coordinate of its center of mass.
- 5) A tank is in the shape of a cone of height 4 and radius 5, with the point up. It is filled with a fluid with density  $\rho$ . Find the work needed to raise all the fluid to the level of the top of the tank.
- 6) The region bounded by  $y = 9$ ,  $x = 0$ , and  $y = 3x$  is revolved around the line  $x = 4$ . Find the resulting volume.
- 7) The region  $R$  is bounded by  $y = x^2$  and  $y = 3 - 2x$ .
- Find the area of  $R$ , integrating with respect to  $x$ .
  - Find the area of  $R$ , integrating with respect to  $y$ .

#### Quiz 8A

- $\int \frac{2x + 31}{x^2 + 3x - 10} dx = ?$
- $\int \frac{3x - 1}{x^2 - 4x + 13} dx = ?$
- $\int_2^3 \frac{x^2}{1 + x^3} dx = ?$
- $\int e^{3 \sin 2x} \cos 2x dx = ?$
- $\int \frac{2x^3 + 2x^2 - x + 2}{x^2 + x} dx = ?$

Quiz 8B

1)  $\int \frac{5x^3 + 5x^2 - x - 1}{x^2 + x} dx = ?$

2)  $\int \frac{2x - 3}{x^2 - 6x + 25} dx = ?$

3)  $\int e^{2 \sin 3x} \cos 3x dx = ?$

4)  $\int \frac{7 - 3x}{x^2 - 7x + 12} dx = ?$

5)  $\int_1^2 \frac{x^3}{1 + x^4} dx = ?$

Quiz 9

For problems 1–3, “does not exist” is a possible answer.

1)  $\int_0^9 \frac{1}{\sqrt{9-x}} dx = ?$

2)  $\int_{-\infty}^8 \frac{1}{\sqrt{9-x}} dx = ?$

3)  $\int_1^{\infty} \frac{1}{z^2 - 2z + 2} dz = ?$

4)  $\int \frac{1}{x^2 \sqrt{3x-2}} dx = ?$

5)  $\int \frac{t^2}{\sqrt{9-4t^2}} dt = ?$