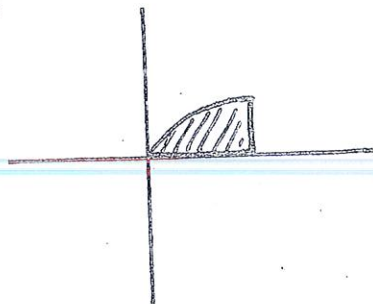


For problems 1- 10, set up definite integral that represents each volume. For 11-12, represent area.

1. Rotate about x-axis  
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

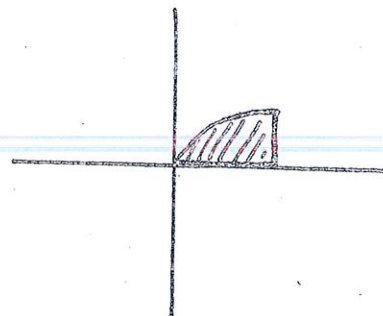


R:

r:

Volume =

2. Rotate about y - axis  
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

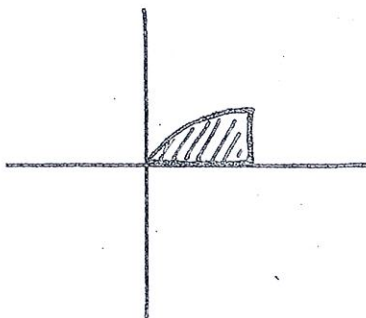


R:

r:

Volume =

3. Rotate about  $y = 20$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

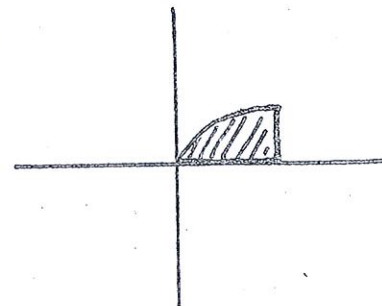


R:

r:

Volume =

4. Rotate about  $x = 4$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

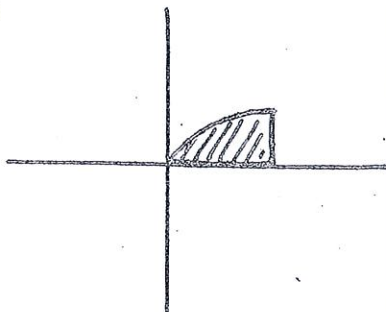


R:

r:

Volume =

5. Rotate about  $x = -3$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

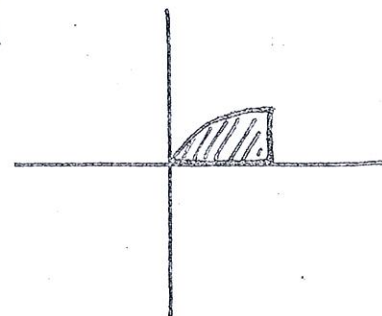


R:

r:

Volume =

6. Rotate about  $x = 6$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

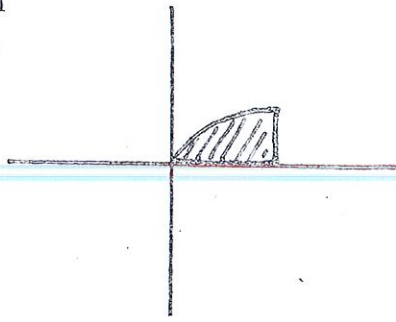


R:

r:

Volume =

7. Rotate about  $y = -1$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

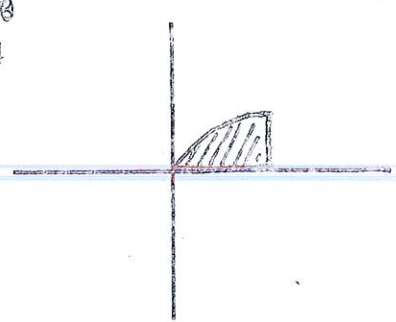


R:

r:

Volume =

8. Rotate about  $y = 10$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

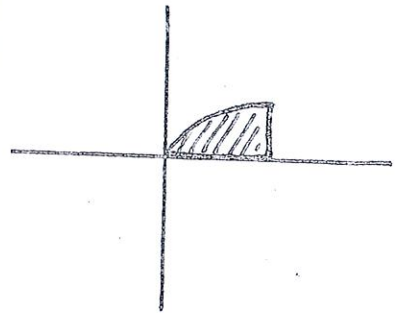


R:

r:

Volume =

9. Rotate about  $x = -1$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

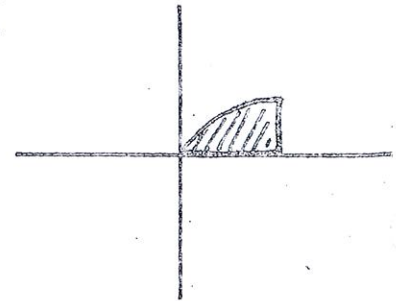


R:

r:

Volume =

10. Rotate about  $x = 9$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

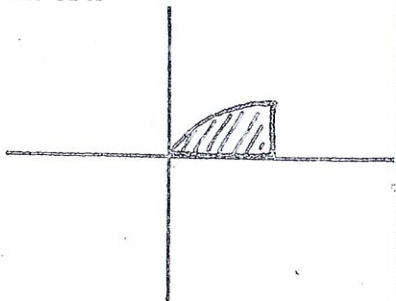


R:

r:

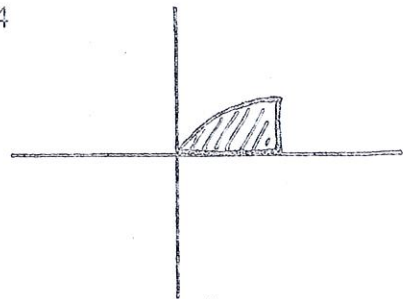
Volume =

11. Find the area in terms of  $x$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$



Area =

12. Find the area in terms of  $y$   
 $y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$

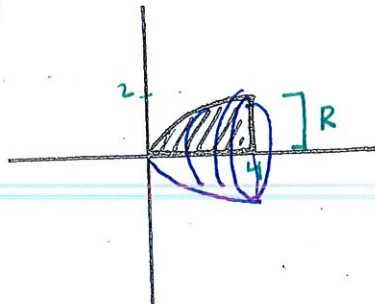


Area =

For problems 1- 10, set up definite integral that represents each volume. For 11-12, represent area.

1. Rotate about x-axis

$$y = x^{1/2}, y = 0, x = 4$$



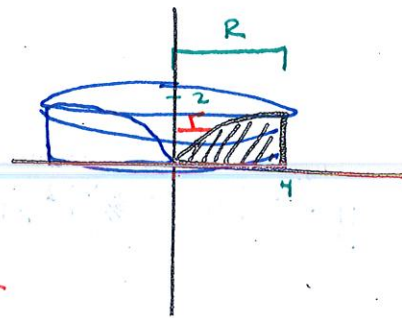
$$R: x^{1/2} - 0$$

r: —

$$\text{Volume} = \pi \int_0^4 (x^{1/2})^2 dx = \boxed{25.133}$$

2. Rotate about y - axis

$$y = x^{1/2}, y = 0, x = 4$$



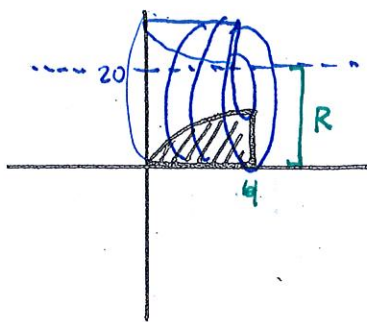
$$R: 4 - 0 = 4$$

$$r: y^2 - 0 = y^2$$

$$\text{Volume} = \pi \int_0^2 (4)^2 - (y^2)^2 dy = \boxed{80.425}$$

3. Rotate about y = 20

$$y = x^{1/2}, y = 0, x = 4$$



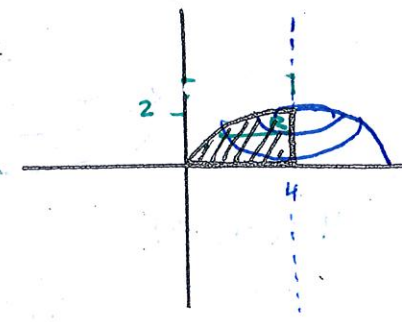
$$R: 20 - 0 = 20$$

$$r: 20 - x^{1/2}$$

$$\text{Volume} = \pi \int_0^4 (20)^2 - (20 - x^{1/2})^2 dx = \boxed{645.074}$$

4. Rotate about x = 4

$$y = x^{1/2}, y = 0, x = 4$$



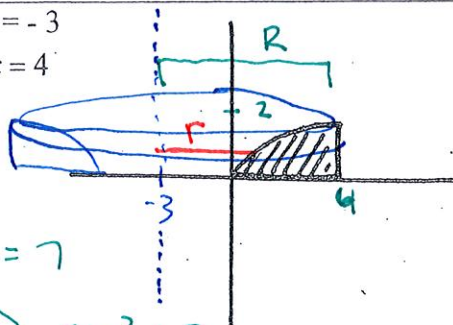
$$R: 4 - y^2$$

r: —

$$\text{Volume} = \pi \int_0^2 (4 - y^2)^2 dy = \boxed{53.617}$$

5. Rotate about x = -3

$$y = x^{1/2}, y = 0, x = 4$$



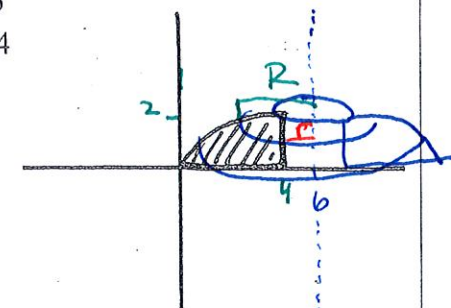
$$R: 4 - (-3) = 7$$

$$r: y^2 - (-3) = y^2 + 3$$

$$\text{Volume} = \pi \int_0^2 (7)^2 - (y^2 + 3)^2 dy = \boxed{180.956}$$

6. Rotate about x = 6

$$y = x^{1/2}, y = 0, x = 4$$



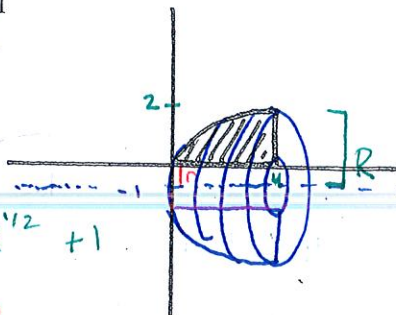
$$R: 6 - y^2$$

$$r: 6 - 4 = 2$$

$$\text{Volume} = \pi \int_0^2 (6 - y^2)^2 - (2)^2 dy = \boxed{120.637}$$

7. Rotate about  $y = -1$

$y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$



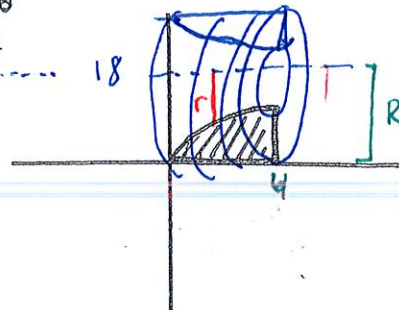
$R = x^{1/2} - (-1) = x^{1/2} + 1$

$r = 0 - (-1) = 1$

Volume =  $\pi \int_0^4 (x^{1/2} + 1)^2 - (1)^2 dx = 58.643$

8. Rotate about  $y = 18$

$y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$



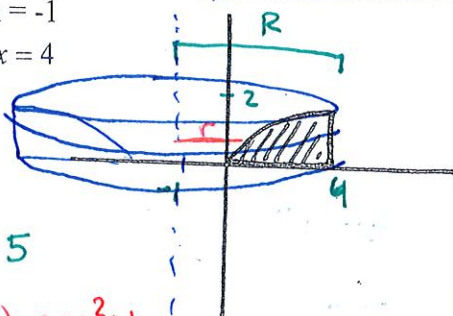
$R = 18 - 0 = 18$

$r = 18 - x^{1/2}$

Volume =  $\pi \int_0^4 (18)^2 - (18 - x^{1/2})^2 dx = 578.053$

9. Rotate about  $x = -1$

$y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$



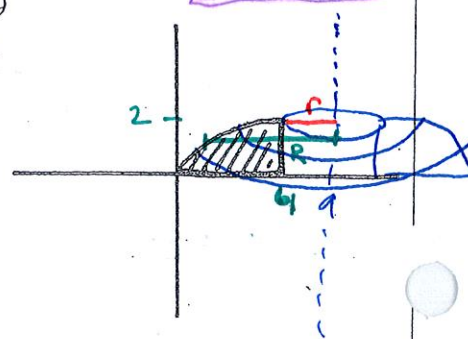
$R = 4 - (-1) = 5$

$r = y^2 - (-1) = y^2 + 1$

Volume =  $V = \pi \int_0^2 (5)^2 - (y^2 + 1)^2 dy = 113.935$

10. Rotate about  $x = 9$

$y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$



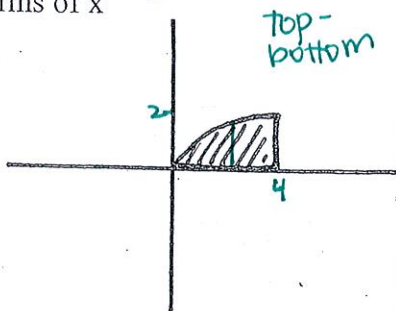
$R = 9 - y^2$

$r = 9 - 4 = 5$

Volume =  $V = \pi \int_0^2 (9 - y^2)^2 - (5)^2 dy = 221.168$

11. Find the area in terms of x

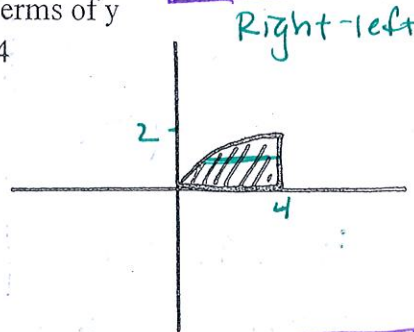
$y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$



Area =  $\int_0^4 x^{1/2} dx = 5.333$

12. Find the area in terms of y

$y = x^{1/2}$ ,  $y = 0$ ,  $x = 4$



Area =  $\int_0^2 (4 - y^2) dy = 5.333$