

22 Definite Integrals

#1-16

Stew Dent
date Per

1. $\int_2^2 g(x) dx = 0$

2. $\int_5^1 g(x) dx = -\int_1^5 g(x) dx = -6$

3. $\int_1^2 3 \cdot f(x) dx = 3 \cdot \int_1^2 f(x) dx = 3 \cdot (-4) = -12$

4. $\int_2^5 f(x) dx = \int_1^5 f(x) dx - \int_1^2 f(x) dx = 6 - (-4) = 10$
 $\int_1^2 + \int_2^5 = \int_1^5$

5. $\int_1^5 [f(x) - g(x)] dx = \int_1^5 f(x) dx - \int_1^5 g(x) dx = 6 - 8 = -2$

6. $\int_1^5 [4 \cdot f(x) - g(x)] dx = 4 \int_1^5 f(x) dx - \int_1^5 g(x) dx = 4(6) - 8 = 16$

7. $\int_1^9 -2f(x) dx = -2 \int_1^9 f(x) dx = -2(-1) = 2$

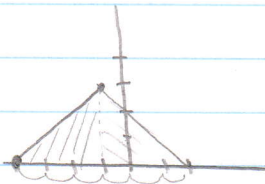
9. $\int_7^9 [f(x) + h(x)] dx = \int_7^9 f(x) dx + \int_7^9 h(x) dx = 5 + 4 = 9$

10. $\int_9^1 f(x) dx = -\int_1^9 f(x) dx = -(-1) = 1$

11. $\int_1^7 f(x) dx = \int_1^9 f(x) dx - \int_7^9 f(x) dx = (-1) - (-5) = -6$
 $\int_1^7 + \int_7^9 = \int_1^9$

12. $\int_9^7 [h(x) - f(x)] dx = \int_9^7 h(x) dx - \int_9^7 f(x) dx = -4 - (-5) = 1$
 $= -\int_7^9 [h(x) - f(x)] dx = -\int_7^9 h(x) dx + \int_7^9 f(x) dx = -(4) + (5) = 1$

13.



$$\int_{-4}^2 f(x) dx = \frac{1}{2}(6)(3) = 9$$

OR $\frac{1}{2}(3)(3) + \frac{1}{2}(3)(3)$

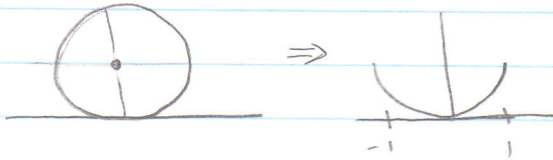
negative branch of circle

$$14. * y = 1 - \sqrt{1-x^2}$$

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

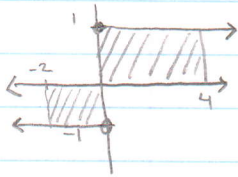
$$(y-1)^2 = (1-x^2)$$

$$x^2 + (y-1)^2 = 1 \leftarrow \text{Circle centered at } (0, 1) \text{ w/ radius } = 1$$



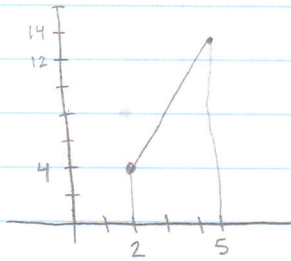
$$\int_{-1}^1 f(x) dx = (2)(1) - \frac{1}{2}\pi(1)^2 = 2 - \frac{\pi}{2}$$

15.



$$\int_{-2}^4 f(x) dx = (2)(1) + (4)(1) = 2$$

16.



$$\int_3^5 f(x) dx = \left(\frac{4+13}{2}\right)(2) = \frac{17}{2}$$

$$\text{or } -\int_2^3 f(x) dx = \left(\frac{4+13}{2}\right)(3) = \frac{51}{2}$$