11) $\int_3^{\infty} \frac{1}{(x-2)^{3/2}}\,dx$

2) $\int_{-\infty}^{0} 2^r\,dr$

3) $\int_0^{\infty} \frac{x^2}{\sqrt{1+x^3}}\,dx$

4) $\int_{-\infty}^{\infty} x e^{-x^2}\,dx$

5) $\int_{-\infty}^{\infty} \cos \pi t\,dt$

6) $\int_1^{\infty} \frac{1}{x^2+x}\,dx$

7) $\int_1^{\infty} \frac{\ln x}{x^3}\,dx$

8) $\int_2^3 \frac{1}{\sqrt{3-x}}\,dx$

9) $\int_{-2}^{14} \frac{dx}{\sqrt[4]{x+2}}$

10) $\int_0^9 \frac{1}{\sqrt[3]{x-1}}\,dx$

11) $\int_0^8 \frac{4}{(x-6)^3}\,dx$

12) Sketch the region enclosed by given curves and find its area:

a. $y = 12 - x^2$, $y = x^2 - 6$

b. $y = e^x$, $y = xe^x$, $x = 0$

c. $x = 2y^2$, $x = 4 + y^2$

e. $y = 1/x$, $y = x$, $y = \frac{1}{4}x$, $x > 0$

d. $x = y^4$, $y = \sqrt{2 - x}$, $y = 0$

13) Find the number b such that line $y = b$ divides the region bounded by the curves $y = x^2$ and $y = 4$ into two regions with equal areas.

14) Find the volume of the solid obtained by rotating the region bounded by given curves about specified lines. Sketch the region, the solid, and a typical disk or washer.

a. $y = 2 - 1/2\,x$, $y = 0$, $x = 1$, $x = 2$; about the x-axis

b. $y = 1 - x^2$, $y = 0$; about the x-axis.

c. $x = 2\sqrt{y}$, $x = 0$, $y = 9$; about the y-axis.

d. $y = x^3$, $y = x$, $x \geq 0$; about the x-axis

e. $y^2 = x$, $x = 2y$; about the y-axis

f. $y = 1/4\,x^2$, $x = 2$, $y = 0$; about the y-axis

j. $y = x$, $y = \sqrt{x}$; about $y = 1$

h. $y = x$, $y = \sqrt{x}$; about $x = 2$

15) Find the volume of the described solid S. A right circular cone with height h and base radius r.

16) Use the method of cylindrical shells to find the volume generated by rotating the region bounded by given curves about the y-axis

a. $y = \sqrt[3]{x}$, $y = 0$, $x = 1$

b. $y = 4x - x^2$, $y = x$

c. $y = x^2$, $y = 6x - 2x^2$

17) Let V be the volume of the solid obtained by rotating about the y-axis the region bounded by $y=\sqrt{x}$ and $y=x^2$. Find V both by slicing and by cylindrical shells. In both cases, draw a diagrame to explain your method.

18) Use the method of cylindrical shells to find the volume of the solid obtained by rotating the region bounded by the given curves about the x-axis.

a. $xy=1$, $x=0$, $y=1$, $y=3$ b. $x=4y^2-y^3$, $x=0$

19) Use the method of cylindrical shells to find the volume generated by rotating the region bounded by the given curves about the specified axis.

a. $y=x^4$, $y=0$, $x=1$; about $x=2$

b. $y=\sqrt{x}$, $y=0$, $x=1$; about $x=-1$

c. $y=x^3$, $y=0$, $x=1$; about $y=1$

20) Use cylindrical shells to find the volume of the solid.

a. A sphere of radius r

b. A right circular cone with height h and base radius r

21) Use the arc length formula to find the length of the curve $y=2x-5$, $-1\leq x\leq 3$. Check your answer by noting that the curve is a line segment and calculating its length by the distance formula.

22) Use the arc length formula to find the length of the curve $y=\sqrt{2-x^2}$, $0\leq x\leq 1$. Check your answer by noting that the

23) Find the exact length of the curve:.

a. $y = 1 + 6x^{3/2}$, $0 \leq x \leq 1$

b. $y^2 = 4(x+4)^3$, $0 \leq x \leq 2$, $y > 0$

c. $y = \frac{x^3}{3} + \frac{1}{4x}$, $1 \leq x \leq 2$

d. $x = \frac{y^4}{8} + \frac{1}{4y^2}$, $1 \leq y \leq 2$

e. $x = \frac{1}{3}\sqrt{y}\,(y-3)$, $1 \leq y \leq 9$

f. $y = \ln(\sec x)$, $0 \leq x \leq \pi/4$

j. $y = \ln(1-x^2)$, $0 \leq x \leq \frac{1}{2}$