Integrate the function.

1) $\int \frac{y^2}{(16 - y^2)^{3/2}}\,dy$ 1) _____

A) $\frac{y}{\sqrt{16 - y^2}} - \sin^{-1}\left(\frac{y}{4}\right) + C$

B) $\sqrt{16 - y^2} - \sin^{-1}\left(\frac{y}{4}\right) + C$

C) $\frac{4y}{\sqrt{16 - y^2}} - \sin^{-1} y + C$

D) $\frac{y}{\sqrt{16 - y^2}} + C$

2) $\int \frac{\sqrt{x^2 - 36}}{x}\,dx$ 2) _____

A) $6\left[\frac{\sqrt{x^2 - 36}}{6} - \sin^{-1}\left(\frac{x}{6}\right)\right] + C$

B) $6\left[\frac{\sqrt{x^2 - 36}}{6} - \sec^{-1}\left(\frac{x}{6}\right)\right] + C$

C) $\left[\frac{\sqrt{x^2 - 36}}{36} - \sec^{-1}\left(\frac{x}{6}\right)\right] + C$

D) $6 \ln\left|\sqrt{x^2 - 36} - \left(\frac{x}{6}\right)\right| + C$

3) $\int \frac{x^3}{\sqrt{x^2 + 3}}\,dx$ 3) _____

A) $\frac{1}{3}(x^2 + 3)^{3/2} - \sqrt{x^2 + 3} + C$

B) $\frac{1}{3}(x^2 + 3)^{3/2} + \tan^{-1}\left(\frac{x}{3}\right) + C$

C) $\frac{1}{3}\sqrt{x^2 + 3} - \frac{3}{\sqrt{x^2 + 3}} + C$

D) $\frac{1}{3}(x^2 + 3)^{3/2} - 3\sqrt{x^2 + 3} + C$

4) $\int_{-1}^{1} \frac{8}{1 + 64t^2}\,dt$ 4) _____

A) $2\tan^{-1}\left(\frac{1}{8}\right)$ B) $2\sin^{-1} 8$ C) $\frac{\pi}{2}$ D) $2\tan^{-1} 8$

Solve the problem.

5) An oil storage tank can be described as the volume generated by revolving the area bounded by $y = \frac{30}{\sqrt{36 + x^2}}$, $x = 0$, $y = 0$, $x = 2$ about the x-axis. Find the volume (in m^3) of the tank. 5) _____

Answers: 1) A 2) B 3) D 4) D 5) 152 m3