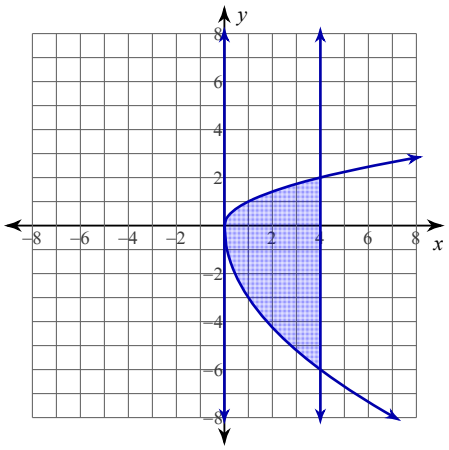
Calculus

# Practice Quiz - Area Between Curves 7-2



**For each problem, find the area of the region enclosed by the curves.**

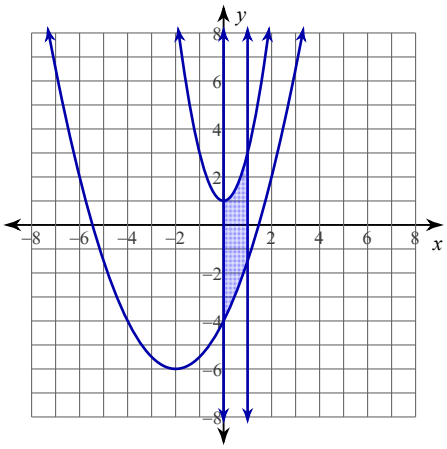
1) $y = \sqrt{x}$, $y = -3\sqrt{x}$, $x = 0$, $x = 4$




$$\int_0^4 \left(\sqrt{x} + 3\sqrt{x}\right) dx$$

$$= \frac{64}{3} \approx 21.333$$

2) $y = 2x^2 + 1$, $y = \frac{x^2}{2} + 2x - 4$, $x = 0$, $x = 1$




$$\int_0^1 \left(2x^2 + 1 - \left(\frac{x^2}{2} + 2x - 4\right)\right) dx$$

$$= \frac{9}{2} = 4.5$$

3) $y = 2x^2 - 4x + 4$, $y = -2x^2 + 1$, $x = 0$, $x = 2$

$$\int_0^2 \left(2x^2 - 4x + 4 - \left(-2x^2 + 1\right)\right) dx$$

$$= \frac{26}{3} \approx 8.667$$

4) $y = 2\sqrt{x}$, $y = \frac{x^2}{4}$

$$\int_0^4 \left(2\sqrt{x} - \frac{x^2}{4}\right) dx$$

$$= \frac{16}{3} \approx 5.333$$

5) $y = -x^3 + 6x,\ y = -x^2$

$$\int_{-2}^{0} \left(-x^2 - \left(-x^3 + 6x\right)\right) dx +$$

$$\int_{0}^{3} \left(-x^3 + 6x + x^2\right) dx$$

$$= \frac{253}{12} \approx 21.083$$

6) $y = \sin x,\ y = -\sin x,$

$x = -\frac{3\pi}{4},\ x = \pi$

$$6 + \sqrt{2} \approx 7.414$$

7) $y = 2\cos x,\ y = -2\cos x,$

$x = -\frac{\pi}{2},\ x = \frac{5\pi}{6}$

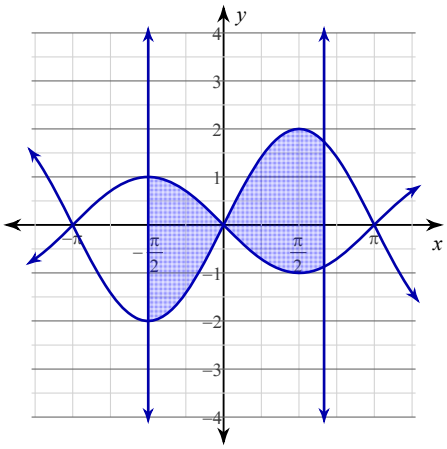
$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \left(2\cos x + 2\cos x\right) dx +$$

$$\int_{\frac{\pi}{2}}^{\frac{5\pi}{6}} \left(2\cos x + 2\cos x\right) dx$$

$$= 10$$

8) $y = -\sin x,\ y = 2\sin x,$

$x = -\frac{\pi}{2},\ x = \frac{2\pi}{3}$




$$\int_{-\frac{\pi}{2}}^{0} \left(-\sin x - 2\sin x\right) dx +$$

$$\int_{0}^{\frac{2\pi}{3}} \left(2\sin x + \sin x\right) dx$$

$$= \frac{15}{2} = 7.5$$