

Some review for quiz

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

$$1) y = \frac{x^2}{2} + x - \frac{11}{2}, y = 2x - 4,$$

$$x = -1, x = 3$$

$$\int_{-1}^3 \left(2x - 4 - \left(\frac{x^2}{2} + x - \frac{11}{2} \right) \right) dx$$

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

$$2) x = 2\sqrt{y}, x = -2\sqrt{y},$$

$$y = 0, y = 4$$

$$\int_0^4 (2\sqrt{y} + 2\sqrt{y}) dy$$

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

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

$$y = 0, y = 3$$

$$\int_0^2 (-2y^2 + 4y + 3 - (2y - 1)) dy +$$

$$\int_2^3 (2y - 1 - (-2y^2 + 4y + 3)) dy$$

$$= \frac{31}{3} \approx 10.333$$

$$4) y = -x^2 - 4x - 1, y = -2x - 4,$$

$$x = -5, x = 0$$

$$\int_{-5}^{-3} (-2x - 4 - (-x^2 - 4x - 1)) dx +$$

$$\int_{-3}^0 (-x^2 - 4x - 1 - (-2x - 4)) dx$$

$$= \frac{59}{3} \approx 19.667$$

$$5) y = 2\cos x, y = -2\sin x,$$

$$x = -\frac{\pi}{6}, x = \frac{\pi}{4}$$

$$\int_{-\frac{\pi}{6}}^{\frac{\pi}{4}} (2\cos x + 2\sin x) dx$$

$$= 1 + \sqrt{3} \approx 2.732$$

$$6) y = \sin x, y = -2\sin x,$$

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

$$\int_{\frac{\pi}{2}}^{\pi} (\sin x + 2\sin x) dx$$

$$= 3$$

$$7) x = y^2 + 6y + 5, x = -y^2 - 6y - 5,$$

$$y = -6, y = -3$$

$$\int_{-6}^{-5} (y^2 + 6y + 5 - (-y^2 - 6y - 5)) dy +$$

$$\int_{-5}^{-3} (-y^2 - 6y - 5 - (y^2 + 6y + 5)) dy$$

$$= \frac{46}{3} \approx 15.333$$

$$8) x = \frac{y^2}{2} - 3y + \frac{1}{2}, x = -\frac{y^2}{2} + y + \frac{1}{2},$$

$$y = -1, y = 3$$

$$\int_{-1}^0 \left(\frac{y^2}{2} - 3y + \frac{1}{2} - \left(-\frac{y^2}{2} + y + \frac{1}{2} \right) \right) dy +$$

$$\int_0^3 \left(-\frac{y^2}{2} + y + \frac{1}{2} - \left(\frac{y^2}{2} - 3y + \frac{1}{2} \right) \right) dy$$

$$= \frac{34}{3} \approx 11.333$$