81. The area of the region enclosed by the curves
\[ y = \sin x, \quad y = \cos x, \quad x = 0 \text{ and } x = \pi \] is

(a) \( 2\sqrt{2} - 1 \)
(b) \( 2\sqrt{2} + 1 \)
(c) \( \sqrt{2} + 2 \)
(d) \( 2\sqrt{2} \)
(e) \( -\sqrt{2} \)

82. The volume of the solid generated by rotating the region enclosed by the curves \( y = x^4 \) and \( y = 1 \) about the line \( y = 2 \) is

(a) 12
(b) \( 4\pi - 11 \)
(c) \( \frac{2}{7} \)
(d) \( \frac{208\pi}{45} \)
(e) \( \frac{204\pi}{31} \)
81. Area of the region bounded by the graphs of equations 
\[ x = y^2 \text{ and } 2y^2 = x+4 \] is

(a) 12

(b) \( \pi - \sqrt{3} \)

(c) \( \frac{32}{3} \)

(d) \( 2\pi + 8 \)

(e) \( \frac{\pi}{2} \)

82. The volume of the solid obtained by rotating the region bounded by the curves 
\[ y = \sqrt{x-1}, \ y = 0 \text{ and } x = 5 \]
about \( x \)-axis is equal to

(a) \( 10\pi \)

(b) \( 4\pi \)

(c) \( 6\pi \)

(d) \( 8\pi \)

(e) \( 2\pi \)
81. The area of the region bounded by the graphs of
\[ y = x^2 - 2 \] and \[ y = x \] is

(a) \( \frac{11}{2} \)
(b) \( \frac{3}{2} \)
(c) \( \frac{7}{2} \)
(d) \( \frac{5}{2} \)
(e) \( \frac{9}{2} \)

82. The volume of the solid generated by rotating
the region enclosed by the curves \( y = x \) and \( y = \sqrt{x} \)
about the y-axis is

(a) \( \pi \int_{y_1}^{y_2} (y - y^2) \, dy \)
(b) \( \pi \int_{y_1}^{y_2} (y^2 - y^4) \, dy \)
(c) \( \pi \int_{0}^{1} (x^2 - x) \, dx \)
(d) \( \pi \int_{1}^{0} (y + y^2) \, dy \)
(e) \( \pi \int_{0}^{1} (x - x^2) \, dx \)
Q1. Area of the region bounded by the graphs of the curves
\[ y = 6 - x^2 \quad \text{and} \quad y = -2x + 3 \] is
(a) \( \frac{32}{3} \)
(b) 12
(c) 1
(d) \( 2\pi \)
(e) \( \sqrt{3} \)

Q2. Volume of the solid generated when region
\[ y = \sqrt{x}, \quad x = 4, \quad y = 0 \]
in revolved about y-axis is
(a) \( \sqrt{2} \pi \)
(b) 9
(c) \( \frac{128 \pi}{5} \)
(d) 12
(e) \( \frac{144 \pi}{7} \)