

MULTIPLE-CHOICE QUESTIONS

(Remember, many of the AB questions are also BC questions.)

- 2007 AB 1; 2a
- 2008 AB 1; 2d; 3c; 4a
- 2009 AB 1b; 3a, b, c; 4
- 2010 AB 4; 5a, c
- 2011 AB 1c, d; 3b, c; 4a BC 1c, d; 3a, b
- 2012 AB 2; 3a; 6b, d BC 2b, d
- 2013 AB 5

For Questions 1 and 2, region R is bounded by $f(y) = y^2 - 3$ and $g(y) = 3y + 1$.

1. Which of the following expressions gives the area of region R ?

- (A) $\int_{-2}^{13} (3y + 1) - (y^2 - 3) dy$
- (B) $\int_{-2}^{13} (y^2 - 3) - (3y + 1) dy$
- (C) $\int_{-2}^{13} (3y + 1) - (y^2 - 3) dy$
- (D) $\int_{-2}^{13} (y^2 - 3) - (3y + 1) dy$
- (E) $\int_{-2}^{13} (3y + 1) + (y^2 - 3) dy$

2. Which of the following expressions gives the volume when region R is rotated about the line $x = -3$?

- (A) $\pi \int_{-2}^{13} [(3y + 4) - (y^2)] dy$
- (B) $\pi \int_{-2}^{13} [(6 - y^2) - (2 - 3y)] dy$
- (C) $\pi \int_{-2}^{13} (2 - 3y^2 - (6 - y^2)) dy$
- (D) $\pi \int_{-2}^{13} (y^2 - 3)^2 - (3y + 1)^2 dy$
- (E) $\pi \int_{-2}^{13} [(3y + 4)^2 - (y^2)^2] dy$

and $x = \frac{\pi}{2}$.

For Questions 3 and 4, region Q is bounded by $y = \sin 2x$, $y = 0$, $x = 0$,

3. What is the area of region Q ?

- (A) 0
- (B) $\frac{1}{2}$
- (C) $\frac{\pi}{2}$
- (D) 1
- (E) None of these