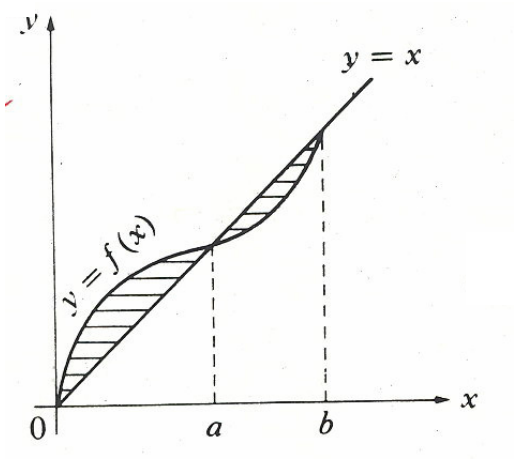
1.



In the diagram the sum of the two shaded areas is:

A $\int_o^a (f(x) - x)dx + \int_a^b (f(x) - x)dx$

B $\int_o^b (f(x) - x)dx$

C $\int_o^a (f(x) - x)dx + \int_a^b (x - f(x))dx$

D $2\int_o^a (f(x) - x)dx$

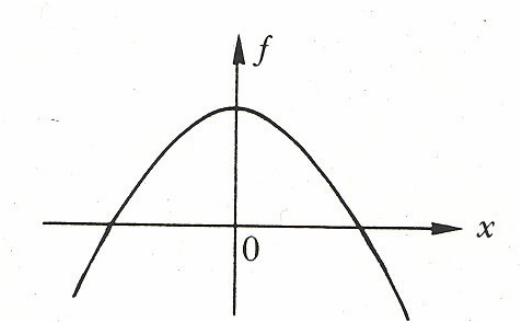
E $\int_o^b (x - f(x))dx$

2. Given that k is a constant of integration then for

$x > 0$, $\int (1 - x^{\frac{-3}{2}})dx$ equals

A $2x^{-\frac{1}{2}} + k$
B $x - 2x^{-\frac{1}{2}} + k$
C $x + 2x^{-\frac{1}{2}} + k$
D $x - 2x^{\frac{1}{2}} + k$
E $x - \frac{1}{2}x^{\frac{1}{2}} + k$

3.



The diagram shows the graph of the function $f\ x \to px^2 + r$. Which of the following statements about p and r is true?

A $p > 0, r > 0$
B $p > 0, r < 0$
C $p < 0, r > 0$
D $p < 0, r < 0$
E There is insufficient information to determine which is true.

4. The locus of the points equidistant from the centres of the circles whose equations are $x^2 + y^2 + 2x + 2y - 7 = 0$ and $x^2 + y^2 = 4$ has equation

A $x + y = -2$
B $x + y = -1$
C $x + y = 1$
D $x + y = 2$
E $x + y = 0$

5. Given that the circle $x^2 + y^2 - 11x - 10y + 24 = 0$ cuts the y-axis at the points P and Q, then the length of PQ is

A 2
B 5
C 10
D 11
E 14

6. Given that $0 \leq x < 2\pi$, in how many points, not lying on the x-axis, does the graph of $y = \sin x$ intersect the graph of $y = \sin 2x$?

A 0
B 1
C 2
D 4
E 8

7. Given that $\int_0^p x^2\,dx = \frac{64}{3}$, then the value of p is

A $\frac{8\sqrt{3}}{3}$
B $\frac{32}{3}$
C 4
D -4
E indeterminable

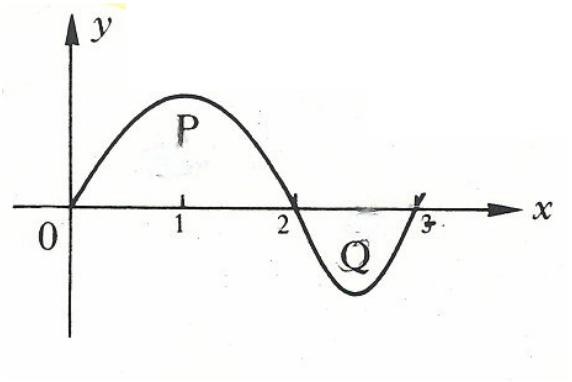
8. $\frac{\sin (90 + \theta)^\circ + \cos \theta^\circ}{\cos \theta)^\circ}$ equals

A 0
B 2
C $2 - \tan \theta^\circ$
D $\sin \theta^\circ + 1$
E $1 + \cos \theta^\circ$

9. Given that $\sin \theta = k$, where $0 \leq \theta < \frac{\pi}{2}$, then $\sin 2\theta$ equals

A $2k$
B $2k\sqrt{(1 - k^2)}$
C $2k\sqrt{(1 + k^2)}$
D $2k^2 - 1$
E $2k^2 + 1$

10.



The equation of the curve is $y = f(x)$.
Area P = 5 square units, and
area Q = 3 square units.
Which of the following is/are true?

(1) $\int_0^2 f(x)\,dx = 5$

(2) $\int_0^3 f(x)\,dx = 8$

(3) $\int_0^3 f(x)\,dx = 3$

A (1) only
B (2) only
C (3) only
D (1), (2) and (3)
E some other combination of (1), (2) and (3)