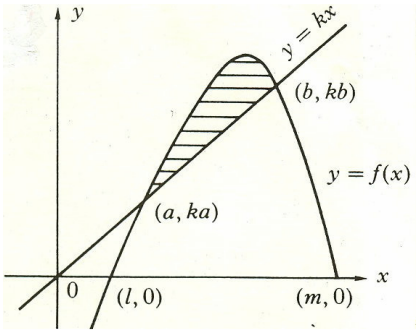
1.



The diagram shows a curve with equation $y = f(x)$ and a straight line with equation $y = kx$. The shaded area in the diagram is given by

A $\int_{l}^{m} f(x)\,dx - \int_{a}^{b} kx\,dx$

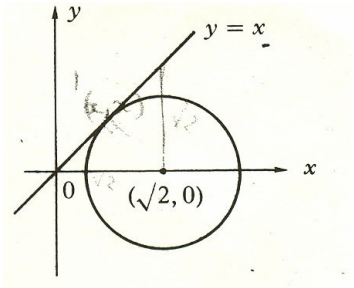
B $\int_{ka}^{kb} f(x)\,dx - \int_{ka}^{kb} kx\,dx$

C $\int_{a}^{b} \{f(x) - kx\}\,dx$

D $\int_{ka}^{kb} \{f(x) - kx\}\,dx$

E none of these

2.



The line $y = x$ is a tangent to the circle with circle $(\sqrt{2}, 0)$. The radius of the circle is

A $\frac{1}{\sqrt{2}}$

B 1

C $\sqrt{2}$

D 2

E none of these

3. If the centre of the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ lies on the *y-axis* then

A $f = 0$

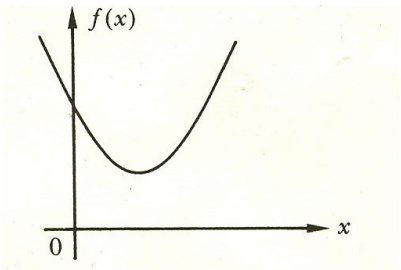
B $g = 0$

C $c = 0$

D $f = g$

E $g^2 + f^2 = c$

4.



The graph in the diagram could be that of the function $f: x \rightarrow$

A $x^2 - 4x + 3$

B $x^2 - 4x + 4$

C $x^2 + 4x + 4$

D $x^2 + 3x - 3$

E $x^2 - 3x + 4$

5. Given that Q is the centre of the circle $x^2 + y^2 + 2x - 4y - 15 = 0$ and R (3, 4) is a point on the circumference, then the gradient of QR is

A 0

B $^1/_3$

C $^1/_2$

D 2

E 3

6. The minimum value of $\cos 120° + \cos x°$, $x \varepsilon R$ is

A $\frac{1}{2}$

B $-\frac{1}{2}$

C $\frac{3}{2}$

D $-\frac{3}{2}$

E $\frac{\sqrt{3}}{2} - 1$

7. The circle with equation $x^2 + y^2 + 6x - 8y - 5 = 0$ has as its centre

A (6, -8)

B (-6, 8)

C (3, -4)

D (-3, 4)

E none of these

8. Given that $f^1(x) = 5x^{\frac{3}{2}}$ and $f(1) = 1$, $f(x)$ is equal to

A $2x^{\frac{5}{2}}$

B $2x^{\frac{5}{2}} - 1$

C $5x^{\frac{5}{2}} - 4$

D $\frac{1}{2}(15x^{\frac{1}{2}} - 13)$

E $\frac{1}{2}(25x^{\frac{5}{2}} - 23)$

9. Given that $0 \leq \alpha \leq \frac{\pi}{2}$ and $\sin \alpha = \frac{3}{5}$ then $\sin(\theta + \alpha)$ equals

A $\sin \theta + \frac{3}{5}$

B $\frac{3}{5}\sin \theta + \frac{4}{5}\cos \theta$

C $\frac{4}{5}\sin \theta + \frac{3}{5}\cos \theta$

D $\frac{3}{5}\sin \theta - \frac{4}{5}\cos \theta$

E $\frac{4}{5}\sin \theta - \frac{3}{5}\cos \theta$

10. $\int_a^b k\,dx$, when k is a non-zero constant, equals

A 0

B $b - a$

C $\frac{1}{2}(b^2 - a^2)$

D $k(b - a)$

E $k(a - b)$

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