Trigonometric Functions

Level 1

1 If $0° < \theta < 90°$ and $3\sin\theta = 2$, $\theta =$

    A 33.7°   **B** 41.8°   **C** 48.2°   **D** 56.3°   **E** 60°

2 If $0° < \theta < 90°$ and $2\tan\theta - 5 = 0$, $\theta =$

    A 21.8°   **B** 23.6°   **C** 36°   **D** 66.4°   **E** 68.2°
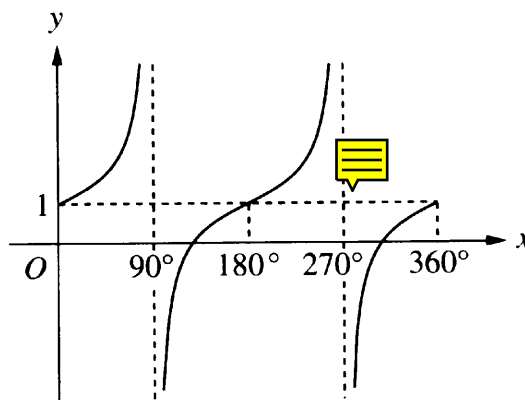
[3] Which of the following functions shows the given graph?

    A $y = \sin x + 1$

    B $y = \sin x + 2$

    C $y = 2\sin x$

    D $y = 2\sin x - 1$

    E $y = 2\sin x + 1$
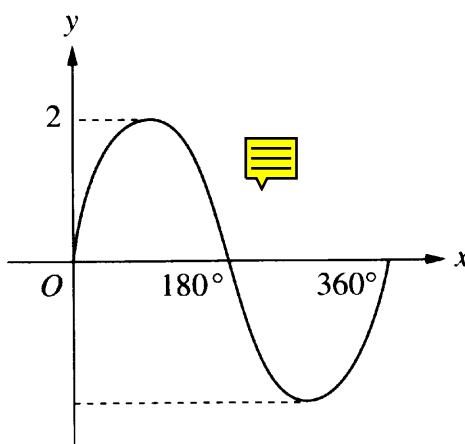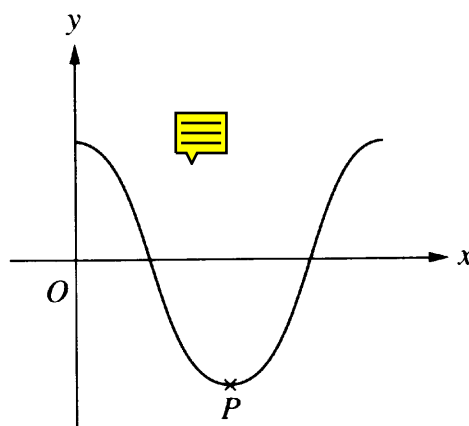

[4] Which of the following functions shows the given graph?

    A $y = \tan x + 1$

    B $y = \tan x - 1$

    C $y = -\tan x$

    D $y = 1 - \tan x$

    E $y = \tan x$

[5] The figure shows the graph of $y = 2\cos\dfrac{x}{3}$. The coordinates of P are

    A $\left(\dfrac{\pi}{3}, -1\right)$

    B $\left(\dfrac{\pi}{3}, -2\right)$

    C $(\pi, -2)$

    D $(3\pi, -1)$

    E $(3\pi, -2)$

[6] The maximum value of $\dfrac{1}{2-\cos\theta}$ is

A -1 B $\dfrac{1}{3}$ C $\dfrac{1}{2}$ D 1 E 3

[7] Solve $(\sin\theta-1)(3\cos\theta-2)=0$ for $0°\le\theta\le360°$.

A $90°$

B $48.2°$, $90°$, $311.8°$

C $48.2°$, $90°$, $131.8°$

D $48.2°$, $90°$, $270°$, $311.8°$

E $41.8°$, $90°$, $138.2°$, $270°$

[8] Solve $\tan^2\theta-3\tan\theta-4=0$ for $0°\le\theta\le360°$.

A $45°$, $225°$

B $135°$, $315°$

C $76.0°$, $135°$, $256.0°$, $315°$

D $45°$, $76.0°$, $225°$, $256.0°$

E $14.0°$, $135°$, $194°$, $315°$

Level 2

[9] Which of the following functions shows the given graph?

A $y=2\sin x$

B $y=2\sin(x-10)$

C $y=2\sin(x+10)$

D $y=2\cos(x-10)$

E $y=2\cos(x+10)$
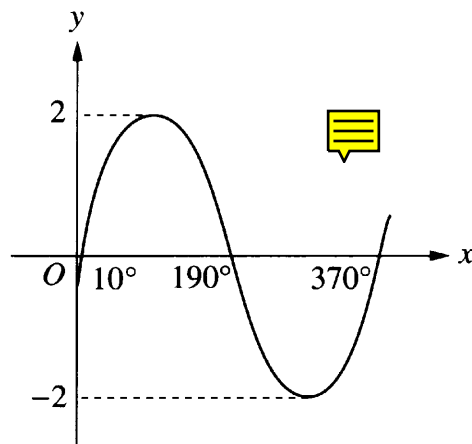
[10] The figure shows the graph of $y=\dfrac{1}{2}\sin 2x$. Find the area of the rectangle $OABC$.

A $\dfrac{1}{4}$

B $\dfrac{1}{2}$

C $\dfrac{\pi}{4}$

D $\dfrac{\pi}{2}$

E π
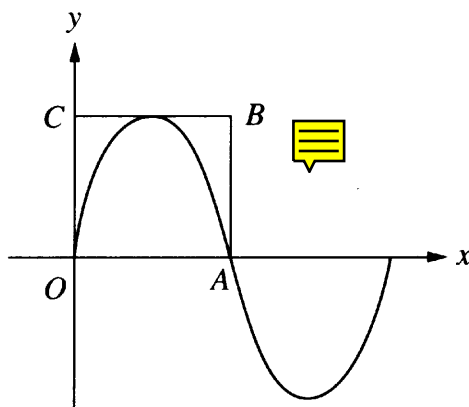
[11] Which of the following shows the graph of $1 - 2\cos x$?

A
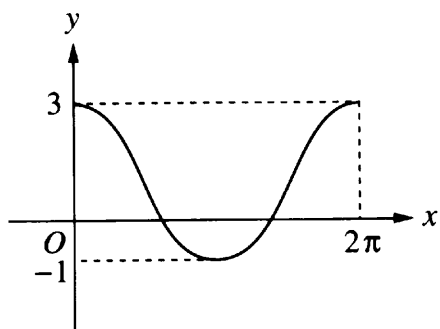
D

B

E

C

[12] The figure shows the graph of $y = k\tan x$. Find the value of k.

A	-2
B	-1
C	$\dfrac{1}{2}$
D	1
E	2

[13] The maximum value of $\sin^2\theta + 3\cos^2\theta - 2$ is

    A 0   **B** 1   **C** 2   **D** 3   **E** 4

[14] Find the minimum value of $y = \dfrac{1}{(\sin x - 2)^2}$.

    A $\dfrac{1}{9}$ **B** $\dfrac{1}{3}$ **C** 1   **D**   **E** 9

[15] The maximum value of $2\sin\dfrac{\theta}{2} + \cos^2\dfrac{\theta}{2}$ is

    A −4   **B** −2   **C** 0   **D** 2   **E** 4
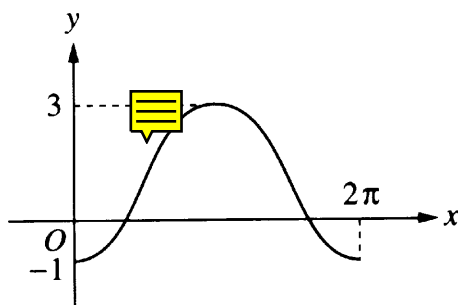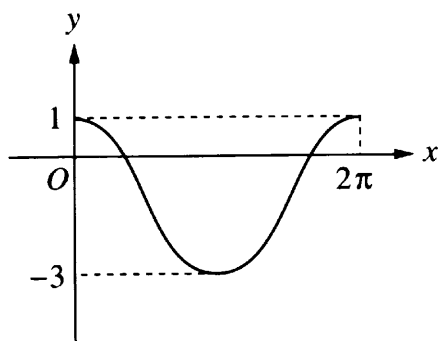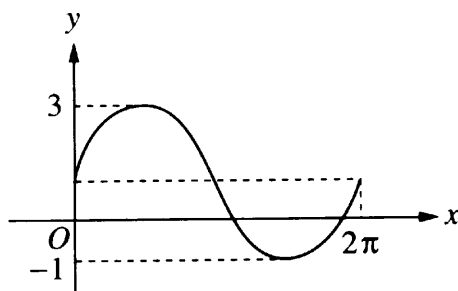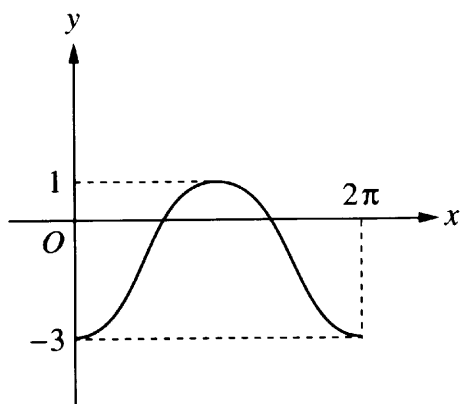
[16] If $\dfrac{\tan\theta}{\cos\theta} = 2\sqrt{3}$ and $0° \le \theta \le 2\pi$, $\theta =$

    A $\dfrac{\pi}{6}$ **D** $\dfrac{\pi}{3}$ or $\dfrac{4\pi}{3}$

    B $\dfrac{\pi}{3}$ **E** $\dfrac{\pi}{3}$ or $\dfrac{2\pi}{3}$

    C $\dfrac{\pi}{3}$ or $\dfrac{5\pi}{3}$

[17] Solve $\cos^2\theta + \sin\theta + 1 = 0$ for $0° \le \theta \le 360°$.

    A   90°   **D**   30° , 150°

    B   270°   **E**   30° , 330°

    C   90°, 270°

[18] Solve $3\sin^2\theta - 5\sin\theta\cos\theta + 4\cos^2\theta = 1$ for $0° \le \theta \le 360°$.

    A   45°, 135°

    B   33.7°, 135°, 236.3°, 315°

    C   33.7°, 45°, 135°, 213.7°

    D   45°, 56.3°, 225°, 236.3°

    E   45°, 56.3°, 225°, 303.7°

[19] For $0 \le \theta \le 2\pi$, how many roots does the equation $\sin^2\theta - 3\sin\theta + 2 = 0$ have?

    A 0   **B** 1   **C** 2   **D** 3   **E** 4

[20] Find the numbers of points of intersection of the graphs $y = \sin x$ and $y = \cos^2 x$ in the interval $0° \le \theta \le 360°$.

    A 0   **B** 1   **C** 2   **D** 3   **E** 4