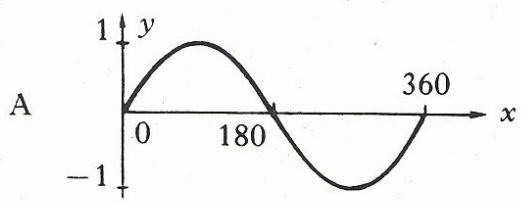
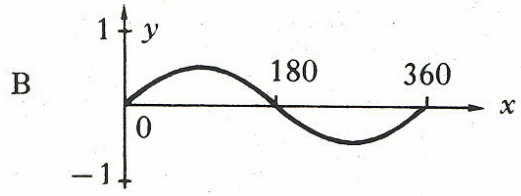
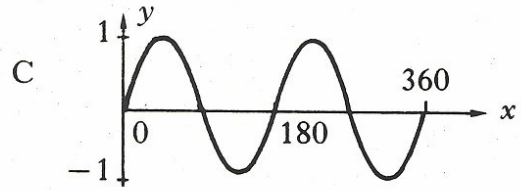
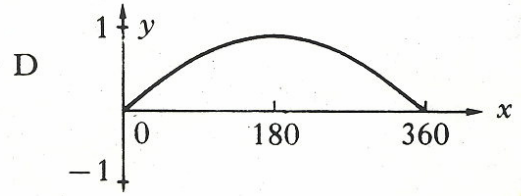
1. Which of the following is most likely to be the graph of

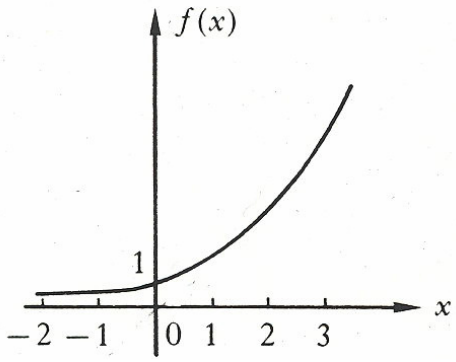
$y = \sin\left(\frac{x}{2}\right)^\circ$, $0 \leq x \leq 360$?

A 

B 

C 

D 

2. 

The diagram could illustrate, for $-2 \leq x \leq 3$, the graph of the function $f: x \rightarrow$

A $\frac{1}{x}$

B $\frac{1}{x+1}$

C $x^2 + 1$

D 2^x

3. The derivative of $\frac{3}{x^2}$, $x \neq 0$, is

A $\frac{3}{2x}$

B $\frac{-6}{x}$

C $\frac{-1}{6x^3}$

D $\frac{-6}{X^3}$

4. If $f: x \rightarrow 3x - 2$ and $g\ x \rightarrow \frac{1}{3}x + 1$ are functions from R to R then $(f \circ g)^{-1}$ maps x to

A $\frac{1}{3}(3x - 1)$

B $x - 1$

C $1 - x$

D $x + 1$

5. Given that the line joining the points (2, 3) and (8, k) is perpendicular to the line $2y - 3x + 5 = 0$, then the value of k is

A -1

B -2

C -3

D -4

6. P is a variable point $(2t, 4t - 6)$. The locus of the mid point of OP where O is the origin has equation

A $y = x - 3$

B $y = x - 6$

C $y = 2x - 3$

D $y = 2x - 6$

7. In how many points does the graph of $f: x \to \cos 4x^\circ$, $0 \leq x < 360$, cut the x-axis ?

A 1
B 2
C 4
D 8

8. Which one of the following is the inverse of $f(x) = x - 2$, where $x \in R$?

A $\frac{1}{x-2}$

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

C $2x + 1$

D $x + 2$

9. Which of the following is true for all lines with equations of the form $ax + 3y - 6 = 0$ where $a \in R$, where R is the set of real numbers?

(1) They have the same gradient.
(2) They cut the x-axis at the same point
(3) They cut the y-axis at the same point

A (1), (2) and (3)
B (1) only
C (2) only
D (3) only

10. The tangent to the curve $y = x^2 + 3x + 5$ at the point (1, 9) has gradient

A 2
B 5
C 10
D 21