Unit 1

1 $\log_2 64 = 6$

2 $125 = 5^3$

3 $\log_e(12wt)$

4 $4\log_3 p$

5 $\log_{10}(3r) - \log_{10} 5$

6 -3

7 34

8 6

9 2

10 $13\cos(x - 67.3801)^\circ$

11 $5\sin(x + 36.8698)^\circ$

12 $\sqrt{53}\cos(x + 4.991)$

13 $\sqrt{34}\sin(x - 5.2528)$

14 $\frac{\sin A\cos B + \cos A\sin B}{\cos A\cos B} = \tan A + \tan B$

15 $\sin x = \frac{12}{13}$

$\cos x = \frac{5}{13}$

$\sin y = \frac{12}{3\sqrt{41}}$

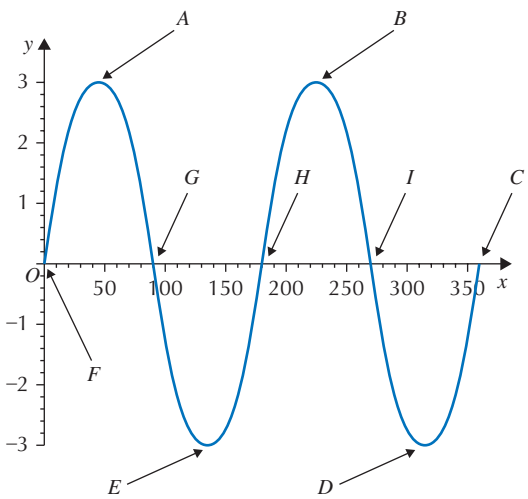
$\cos y = \frac{15}{3\sqrt{41}}$

$\sin(x + y) = \sin x\cos y + \cos x\sin y$

$= \frac{12}{13}\frac{15}{3\sqrt{41}} + \frac{5}{13}\frac{12}{3\sqrt{41}}$

$= \frac{80}{13\sqrt{41}}$

16 a



$A(45, 3)$

$B(225, 3)$

$C(360, 0)$

$D(315, -3)$

$E(135, -3)$

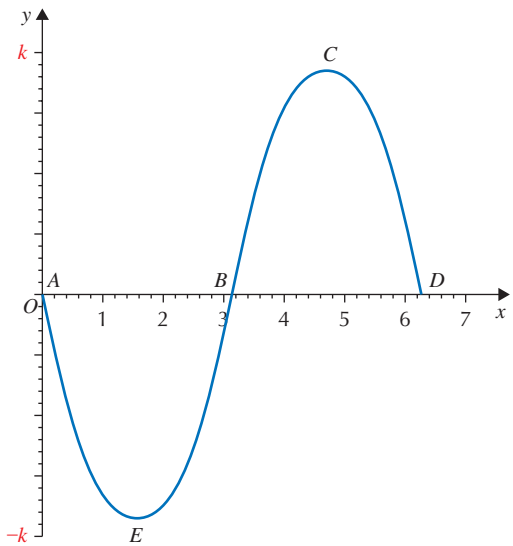
$F(0, 0)$

$G(90, 0)$

$H(180, 0)$

$I(270, 0)$

b



$A(0, 0)$

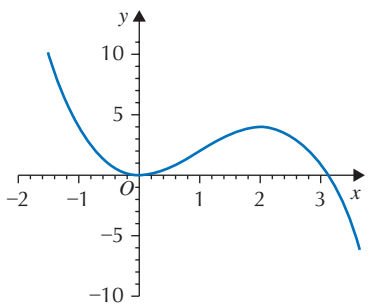
$B(\pi, 0)$

$C\left(\frac{3\pi}{2}, k\right)$

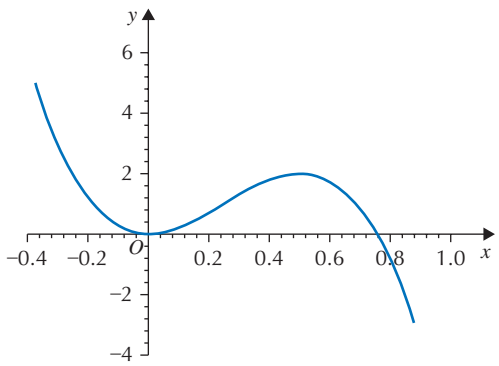
$D(2\pi, 0)$

$E\left(\frac{\pi}{2}, -k\right)$

17 a



b



18 3

19 a = 3

b = 2

$c = \frac{\pi}{2}$

20 $a = 4$

$b = 2$

21 a $x + 1$

b domain ≥ 2

c range ≥ 3

22 a $h(x) = 3(\sin x)^2$

$0 \leq h \leq 3$

23 a $f(g(x)) = x$

b f and g are mutually inverse.

24 $\frac{2}{x} - 7$

25 $\overrightarrow{DB} = \begin{pmatrix} 4 \\ 4 \\ -9 \end{pmatrix}$

26 No

27 a No. $\overrightarrow{AB} \neq q \times \overrightarrow{AC}$ where q is a constant.

b see (a) above.

28 Assuming T is nearer to R than to U:

$T(4,-4,6)$