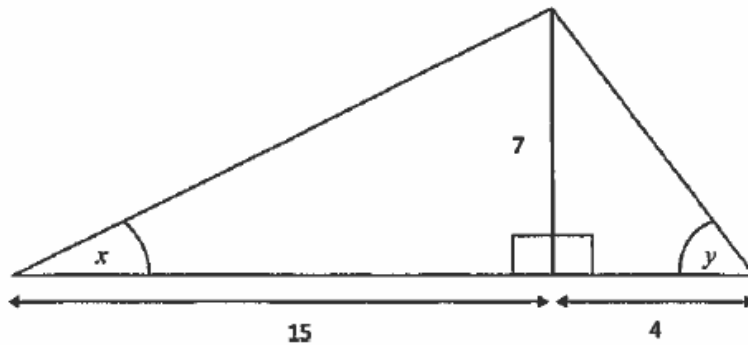


Revision C2

1 Express  $5\sin x + 4\cos x$  in the form  $k\sin(x + a)^\circ$  where  $k > 0$  and  $0^\circ \leq a^\circ \leq 360^\circ$ . [4]

2 The diagram below shows two right-angled triangles. Find the exact value of  $\cos(x + y)$ . [4]



3 Show that  $(3 + 2\cos x)(3 - 2\cos x) = 5 + 4\sin^2 x$ . [#2.1 + 3]

4. Find  $\int \left( 4x^{\frac{1}{3}} + \frac{1}{x^3} \right) dx, x > 0$ .

5.  $h'(x) = (x + 5)^{-4}$  find  $h(x), x \neq -5$ .

6. Find  $\int 4\cos \theta d\theta$ .

7. Find  $\int_{-3}^2 (x^2 - 8x + 16) dx$ .

8. (a) Express  $f(x) = \sqrt{3}\cos x + \sin x$  in the form  $k\cos(x - a)$ , where  $k > 0$  and  $0 < a < \frac{\pi}{2}$ .

(b) Hence or otherwise sketch the graph of  $y = f(x)$  in the interval  $0 \leq x \leq 2\pi$ .

9. (a) Write  $\sqrt{3} \sin x^\circ + \cos x^\circ$  in the form  $k \sin(x+a)^\circ$  where  $k > 0$  and  $0 \leq a < 360$ .
- (b) Hence find the maximum value of  $5 + \sqrt{3} \sin x^\circ + \cos x^\circ$  and determine the corresponding value of  $x$  in the interval  $0 \leq x \leq 360$ .

10. Differentiate  $\sin 2x + \frac{2}{\sqrt{x}}$  with respect to  $x$ .

11. Given  $f(x) = \cos^2 x - \sin^2 x$ , find  $f'(x)$ .

12. Given that  $f(x) = 5(7 - 2x)^3$ , find the value of  $f'(4)$ .

13. Differentiate  $2x^{\frac{3}{2}} + \sin^2 x$  with respect to  $x$ .