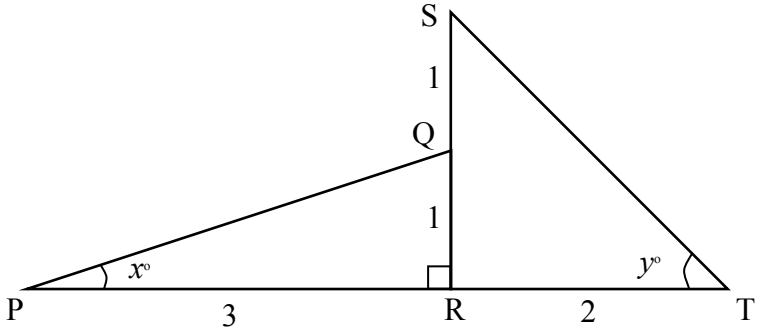
WAVE FUNCTION

EXPRESSIONS AND FORMULAE 1.2

PRACTICE A

1. The diagram below shows two right-angled triangles PQR and SRT.



SQ = QR = 1
PR = 3
RT = 2

(a) Write down the values of $\cos x^\circ$ and $\sin y^\circ$.

(2)

(b) By expanding $\sin(x+y)^\circ$ show that the **exact** value of $\sin(x+y)^\circ$ is $\frac{8}{\sqrt{80}}$. (Do not simplify any of your answers) **(2)**

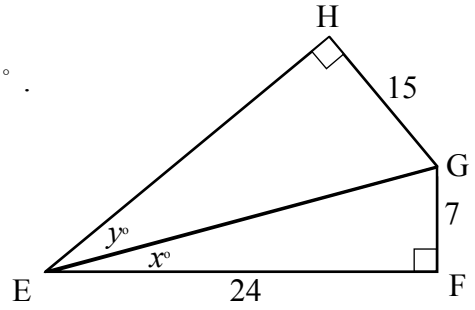
2. Express $4\cos x^\circ + \sin x^\circ$ in the form $k\cos(x - a)^\circ$ where $k > 0$ and $0 \le a < 360$. **(5)**

3. Show that $(4\cos x - 2\sin x)(\cos x + 2\sin x) \equiv 4\cos 2x + 3\sin 2x$. **(2)**

PRACTICE B

1. The diagram shows two right-angled triangles EFG and EHG.

$\angle FEG = x^\circ$ and $\angle HEG = y^\circ$.



(a) Write down the values of $\sin x^\circ$ and $\cos y^\circ$.

(2)

(b) By expanding $\cos(x + y)^\circ$ show that the **exact** value of $\cos(x + y)^\circ$ is $\frac{3}{5}$. **(2)**

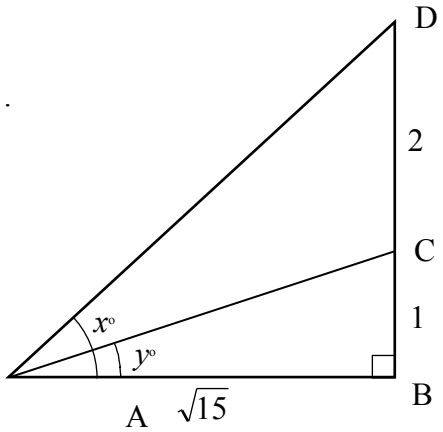
2. Express $5\sin x^\circ + 2\cos x^\circ$ in the form $k\cos(x - a)^\circ$ where $k > 0$ and $0 \le a < 360$. **(5)**

3. Show that $2\cos 2x + 3\sin^2 x \equiv 2 - \sin^2 x$. **(2)**

PRACTICE C

1. The diagram shows two right-angled triangles ABC and ABD.

$\angle DAB = x^\circ$ and $\angle CAB = y^\circ$.



(a) Write down the values of $\cos x^\circ$ and $\sin y^\circ$.

(2)

(b) By expanding $\cos(x - y)^\circ$ show that the **exact** value of $\cos(x - y)^\circ$ is $\frac{18}{4\sqrt{24}}$. **(2)**

2. Express $7\sin x^\circ + 4\cos x^\circ$ in the form $k\cos(x - a)^\circ$ where $k > 0$ and $0 \le a < 360$. **(5)**

3 Show that $(\sin x + \cos x)^2 \equiv 1 + \sin 2x$ **(2)**