Solve the equation $\sin 2x° = 6\cos x°$ for $0 \leq x \leq 360$. **4**

(*a*) Diagram 1 shows a right angled triangle, where the line OA has equation $3x - 2y = 0$.

(i) Show that $\tan a = \frac{3}{2}$.

(ii) Find the value of sin*a*. **4**

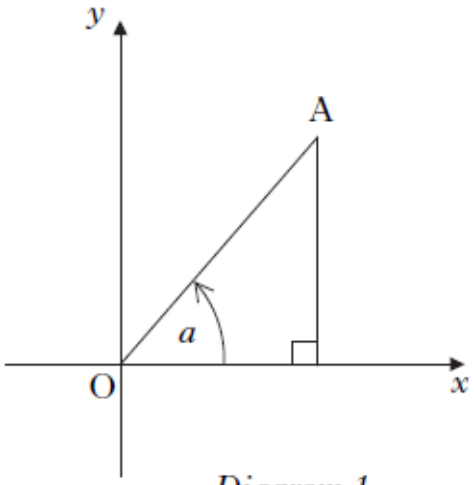



*Diagram 1*

(*b*) A second right angled triangle is added as shown in Diagram 2.

The line OB has equation $3x - 4y = 0$.

Find the values of sin*b* and cos*b*. **4**

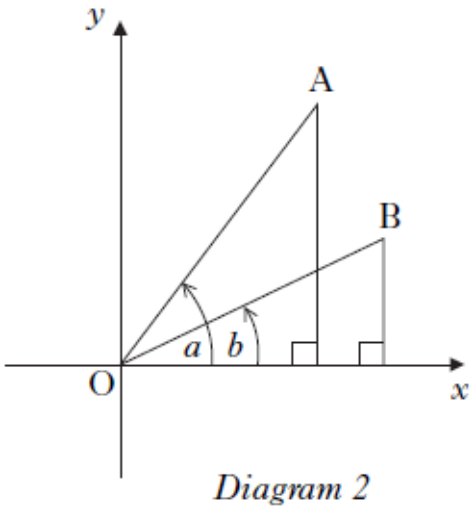


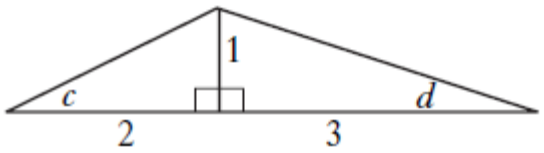

*Diagram 2*

(*c*) (i) Find the value of $\sin(a - b)$.

(ii) State the value of $\sin(b - a)$. **4**

Solve $2\cos 2x - 5\cos x - 4 = 0$ for $0 \leq x < 2\pi$. **5**

The diagram shows two right-angled triangles with angles $c$ and $d$ marked as shown.




(*a*) Find the exact value of $\sin(c + d)$. **4**

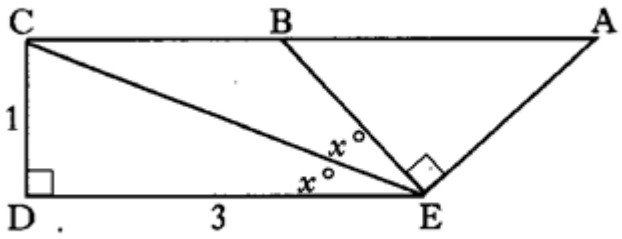
(*b*) (i) Find the exact value of $\sin 2c$.

(ii) Show that $\cos 2d$ has the same exact value. **4**

Solve the equation $\cos 2x° + 2\sin x° = \sin^2 x°$ in the interval $0 \leq x < 360$. **5**

In the diagram
angle DEC = angle CEB = $x°$ and
angle CDE = angle BEA = 90°.
CD = 1 unit; DE = 3 units.

By writing angle DEA in terms of $x°$, find the exact value of cos(DÊA). **7**



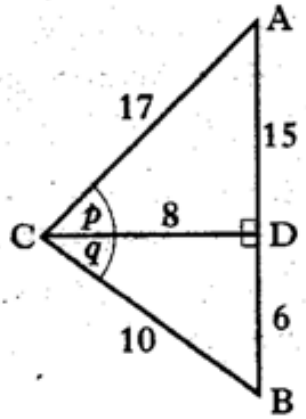

**Triangles ACD and BCD are right-angled at D with angles $p$ and $q$ and lengths as shown in the diagram.**

**(*a*) Show that the exact value of $\sin(p + q)$ is $\frac{84}{85}$.** **4**

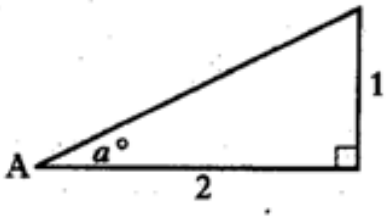
**(*b*) Calculate the exact values of:**

**(i) $\cos(p + q)$;**

**(ii) $\tan(p + q)$.** **3**



The diagram shows a right-angled triangle with height 1 unit, base 2 units and an angle of $a°$ at A.




(*a*) Find the exact values of:

(i) $\sin a°$;

(ii) $\sin 2a°$. **4**

(*b*) By expressing $\sin 3a°$ as $\sin(2a + a)°$, find the exact value of $\sin 3a°$. **4**

Solve the equation $\sin x° - \sin 2x° = 0$ in the interval $0 \leq x \leq 360$. **4**