Wave Function

1. Express the following in the form $k\cos(x - a)^0$ where k > 0 and $0 \le a \le 360^0$. a) $\cos x^0 + \sin x^0$ b) $4\cos x^0 - 3\sin x^0$ (8) 2. Express the following in the form $rcos(\theta - a)$ where r > 0 and $0 \le a \le 2\pi$. a) $3\sin\theta - 3\cos\theta$ b) $2\cos\theta - \sqrt{12}\sin\theta$ (8) 3. Express the following in the form ksin $(x - a)^0$ where k > 0 and $0 \le a \le 360^0$. a) $2.5 \sin x^0 + 5 \cos x^0$ b) $\sqrt{6}\cos x^0 - \sqrt{2}\sin x^0$ (8) 4. Express $4\cos^2 x^2$ - $3\sin^2 x^2$ in the form $k\sin(2x - a)^2$ where k > 0 and $0 \leq \alpha \leq 360^{\circ}$. (4) 5. $F(x) = 2\cos x + 3\sin x$. a) Express f(x) in the form $k\cos(x - a)^0$ where k > 0 and $0 \le a \le 360^0$. (4) b) Hence solve algebraically f(x) = 0.5 for $0 \le a \le 360^{\circ}$. (4) 6. Solve the equation $3\cos x + \sin x = 2$ for $0 \le x \le 2\pi$. (8) 7. a) What is the minimum value of $g(x) = 2 + 3\cos x - 4\sin x$? (5) b) For what value of x, between 0 and 360, does the minimum occur? (3) Revision 8. Show that $\cos(x - \frac{\pi}{6}) - \cos(x + \frac{\pi}{6}) = \sin x$ (3)

52 marks