FP1 Revision Worksheet Number 1

1. Fill in the gaps in the following table:

Angle in degrees	**Angle in radians**	**sine**	**cosine**	**tangent**
				$\frac{1}{\sqrt{3}}$
		$\frac{1}{\sqrt{2}}$		
	$\frac{\pi}{2}$			
			-1	

2. For the equation $7x^3 + 23x = 4 - 34x^2$

(a) Show there is a root between 0 and 1

(b) Use interval bisection to find the interval of width 0.25 that contains this root

3. Try the following improper integrals. Either find the value, or explain why a value cannot be found.

(a) $\int_0^5 \left(6 + \frac{2}{x^2}\right) dx$

(b) $\int_1^\infty \left(\frac{6}{x^7}\right) dx$

4. Solve the following equation to find z in the form a+bi:

$zz^* = 23 + 15i - 5z$

5. Calculate the value of the following:

$\sum_{r=1}^{8} r^2 - 4r + 3$

6. Find the general solution of the following equation:

$\cos\left(3x + \frac{\pi}{4}\right) = \frac{1}{2}$

7. Write down the matrix that represents a transformation by 60° anticlockwise about the origin, and find the image of the point (2,-1) under this transformation.

8. The equation $2x^2 - 3x + 1 = 0$ has roots α, β. Find an equation with integer coefficients that has roots $\frac{1}{\alpha^2}$ and $\frac{1}{\beta^2}$.