

Name: _____

1. Find the tangent to the circle with equation $x^2 - 4x + y^2 = 165$ at the point (7, 12).	$y = -\frac{5}{12}x + \frac{179}{12}$
2. The equation $x^2 + kx + 4 = 0$ has one repeated real root. Find the possible values of k .	Discriminant is equal to zero, i.e. $k^2 - 4(1)(4) = 0$ So $k = \pm 4$
3. Solve the equation $\log_2(x+3) - 2\log_2(x) = 4$. Give your answer to three significant figures.	$\frac{1 + \sqrt{193}}{32}$. The negative solution is not valid since $2\log_2(x)$ is not defined for negative x
4. Prove that $(\tan \theta \sin \theta)^2 \equiv \tan^2 \theta - \sin^2 \theta$	Some steps are skipped here due to a lack of space... $(\tan \theta \sin \theta)^2 \equiv \frac{\sin^2 \theta \sin^2 \theta}{\cos^2 \theta} \equiv \frac{\sin^2 \theta - \sin^2 \theta \cos^2 \theta}{\cos^2 \theta} \equiv \frac{\sin^2 \theta}{\cos^2 \theta} - \frac{\sin^2 \theta \cos^2 \theta}{\cos^2 \theta} \equiv \tan^2 \theta - \sin^2 \theta$