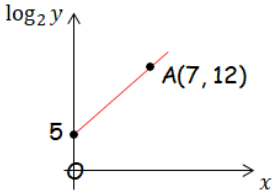
Name:	Date:
Question 1: For the graph below, two variables, x and y, are connected by the law $y = ka^x$.  Find the values of k and a.	14·4 Silver Outcome 2
Question 2: Given that $x^2 + 4p = -px + 15$ has no real roots, find the range of values for p.	8·4 Gold Outcome 3
Question 3: Solve $\cos 2x - 9\cos x = 4$ for $0 \leq x \leq 2\pi$.	10·2 Gold Outcome 3
Question 4: Express $-10x^2 + 80x + 8$ in the form $a(x+b)^2 + c$.	8·2 Silver Outcome 1
Question 3: Show that the line $y = 4 - x$ does not intersect the circle with equation $x^2 + y^2 + 4x - 5y + 7 = 0$.	11·3 Gold Outcome 3
My score:	

Exam Questions

Question 1:

(a) The expression $\sqrt{3}\sin x° - \cos x°$ can be written in the form $k\sin(x - a)°$, where $k > 0$ and $0 \le a < 360$.

Calculate the values of k and a. **4**

(b) Determine the maximum value of $4 + 5\cos x° - 5\sqrt{3}\sin x°$, where $0 \le x < 360$. **2**

Question 2:

A function f is defined by the formula $f(x) = 2x^3 - 7x^2 + 9$ where x is a real number.

(a) Show that $(x - 3)$ is a factor of $f(x)$, and hence factorise $f(x)$ fully. **5**

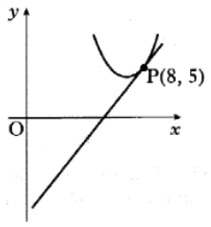
(b) Find the coordinates of the points where the curve with equation $y = f(x)$ crosses the x- and y-axes. **2**

(c) Find the greatest and least values of f in the interval $-2 \le x \le 2$. **5**

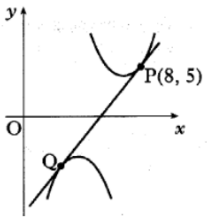
Question 3:

The parabola with equation $y = x^2 - 14x + 53$ has a tangent at the point P(8, 5).

(a) Find the equation of this tangent. **4**



(b) Show that the tangent found in (a) is also a tangent to the parabola with equation $y = -x^2 + 10x - 27$ and find the coordinates of the point of contact Q. **5**



My score: