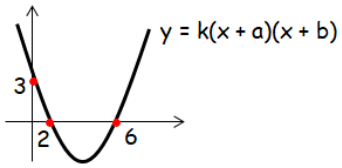
| Name: | Date: |
|---|---|
| Question 1:<br>Show that $(x-3)$ is a factor of $x^3+9x^2-9x-81$ and hence factorise it fully. | 7·1 Bronze Outcome 1 |
| Question 2:<br>The equation of the parabola shown is of the form y = k(x + a)(x + b).<br>  <br>What is the equation of this quadratic? | 8·1 Silver Outcome 2 |
| Question 3:<br>A curve for which $\frac{dy}{dx}=6-2x$ passes through the point (4, 10).<br>Express y in terms of x. | 9·3 Outcome 1 |
| Question 4:<br>What is the value of k such that the equation $kx^2 + x + 7 = 0$ has equal roots? | 8·4 Bronze Outcome 1 |
| Question 5:<br>A point (x, y) lies on the curve with equation $y = x^2 + 8x$. Calculate the coordinates for which the gradient of the tangent is 0. | 6·3 Gold Outcome 3 |
| My score: | |

# Exam Questions

## Question 1:

Given that $f(x) = (5x - 4)^{\frac{1}{2}}$,
evaluate $f'(4)$. 3

## Question 2:

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

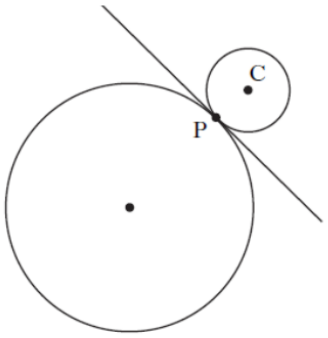
**4**

## Question 3:

(*a*) (i) Show that the line with equation $y = 3 - x$ is a tangent to the circle with equation $x^2 + y^2 + 14x + 4y - 19 = 0$. 5

(ii) Find the coordinates of the point of contact, P.

(*b*) Relative to a suitable set of coordinate axes, the diagram below shows the circle from (*a*) and a second smaller circle with centre C.




The line $y = 3 - x$ is a common tangent at the point P.
The radius of the larger circle is three times the radius of the smaller circle.
Find the equation of the smaller circle. 6

## My score: