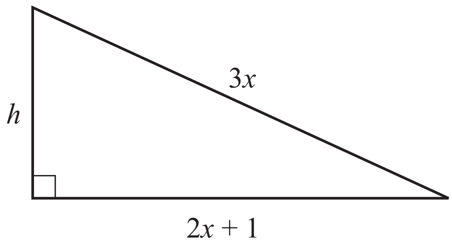
1 Make r the subject of the formula $A = \pi r^2(x+y)$, where $r > 0$. **[2]**

2 Fig. 8 shows a right-angled triangle with base $2x+1$, height h and hypotenuse $3x$.



Not to scale

Fig. 8

(i) Show that $h^2 = 5x^2 - 4x - 1$. **[2]**

(ii) Given that $h = \sqrt{7}$, find the value of x, giving your answer in surd form. **[3]**

3 **(i)** Find the set of values of k for which the line $y = 2x + k$ intersects the curve $y = 3x^2 + 12x + 13$ at two distinct points. **[5]**

(ii) Express $3x^2 + 12x + 13$ in the form $a(x+b)^2 + c$. Hence show that the curve $y = 3x^2 + 12x + 13$ lies completely above the x-axis. **[5]**

(iii) Find the value of k for which the line $y = 2x + k$ passes through the minimum point of the curve $y = 3x^2 + 12x + 13$. **[2]**

4 Make a the subject of $3(a+4) = ac + 5f$. **[4]**

5 Find the coordinates of the point of intersection of the lines $y = 3x - 2$ and $x + 3y = 1$. **[4]**

6 Express $3x^2 - 12x + 5$ in the form $a(x - b)^2 - c$. Hence state the minimum value of y on the curve $y = 3x^2 - 12x + 5$. **[5]**

7 Simplify $\dfrac{(4x^5y)^3}{(2xy^2) \times (8x^{10}y^4)}$. **[3]**

8 You are given that $f(x) = x^2 + kx + c$.

Given also that $f(2) = 0$ and $f(-3) = 35$, find the values of the constants k and c. **[4]**

9 Rearrange the equation $5c + 9t = a(2c + t)$ to make c the subject. **[4]**

10 Factorise and hence simplify the following expression.

$$\frac{x^2 - 9}{x^2 + 5x + 6}$$

[3]

11 Rearrange the following equation to make h the subject.

$$4h + 5 = 9a - ha^2$$ **[3]**