**Question 1**

Express $x^{2}+10x-15$  in the form $(x+p)^{2}+q$ .

 ..........................  **(2 marks)**

**Question 2**

Express $x^{2} -6x-81$  in the form $(x- p)^{2} +q$ .

 **.......................... (2 marks)**

**Question 3**

Express $7-4x-x^{2}$  in the form $p-\left(x+q\right)^{2}$  where $p$  and $q$  are constants.

 **.......................... (2 marks)**

**Question 4**

Write $2x^{2}-8x+9$  in the form $a\left(x+b\right)^{2}+c$

 **.......................... (3 marks)**

**Question 5**

Write $3x^{2}-12x+7$  in the form $a\left(x+b\right)^{2}+c$

 **.......................... (3 marks)**

**Question 6** Solve by factorisation $2x^{2}+5x-12=0$

 **.......................... (3 marks)**

**Question 7** Solve by factorisation $3x^{2}+11x-20=0$

 **.......................... (3 marks)**

**Question 8**

Solve the equation $3x^{2}+9x-2=0$  correct to 1 decimal place.

 **.......................... (3 marks)**

**Question 9**

Solve the equation $10x^{2}+3x-11=0$  correct to 1 dp.

 **.......................... (3 marks)**

**Question 10**

Solve $\frac{3}{x-2}+\frac{2}{x-1}=5$  Do **not** use trial and improvement.
 Write your solutions to 3 significant figures.

 **.......................... (6 marks)**

**Question 11**

Solve $x^{2}+8x+6=0$ by completing the square.
Give your answer in the form $a\pm \sqrt{b}$ , where $a$  and $b$  are integers.

 **.......................... (4 marks)**

**Question 12**

Solve $x^{2}+6x+2=0$  Give your answer in the form $a\pm \sqrt{b}$  where $a$  and $b$  are integers.

 **.......................... (4 marks)**

**Question 13**

Use the discriminant to determine the nature of the roots of the function $f\left(x\right)=7x^{2}+5x-1$

 **.......................... (2 marks)**

**Question 14**

Determine the nature of the roots of the equation

$3x^{2}-2x+7=0$

[   ]  "two real and distinct roots"
[   ]  "one real repeated root" / "equal roots"
[   ]  "no real roots"

**Question 15**

Find the value of $q$  for which the equation $qx^{2}-6x+18=0$  has one repeated real root.

$q=$  **..........................**

**Question 16**

A curve has the equation $y=2x^{2}-8x-5$ .

Find the coordinates of the point where the curve intercepts the $y$ -axis.

 **.......................... (1 mark)**

**Question 17**

Below is a sketch of the graph with equation $y=x^{2}-3x-18$ .

Work out the values of $a$  and $b$ .



 **..........................**

**Question 18**

Sketch the graph of $y =(x-6)(x+4)$ .
On your sketch, show clearly the points of intersection with the $x$ -axis and the $y$ -axis, and the coordinates of the turning point.

 **(2 marks)**

**Question 19** This is a sketch of the graph of $y=\left(x-1\right)\left(x-3\right)$ .



 Work out the coordinates of the turning point Q.

 **.......................... (3 marks)**

**Question 20**

You are given that $x^{2}+6x+2≡\left(x+3\right)^{2}-7$

Write the coordinates of the minimum point on the curve $y=x^{2}+6x+2$

 **.......................... (1 mark)**

**Question 21**

The curve $C$  has equation $y=3-5\left(x+1\right)^{2}$

The point $A$  is the maximum point on $C$. Write down the coordinates of $A$ .

 **.......................... (1 mark)**

**Question 22**

By completing the square, find the coordinates of the turning point of the curve with equation $y = x^{2} + 10x + 18$  You must show all your working.

 **.......................... (3 marks)**