

**5.0C Calculator practice: Linear regression, systems of equations, cosine rule, frequency table statistics**

1. Apply the law of cosines,
- $c^2 = a^2 + b^2 - 2ab \cos \theta$
- .

(a)  $a = 12.3$ ,  $b = 14.7$ ,  $\theta = 71^\circ$ . Find the third side length,  $c$ . [3](b)  $a = 11.4$ ,  $b = 17.1$ ,  $c = 16.0$ . Find  $\hat{C}$  (the angle opposite side  $c$ ). [3]**Working:****Answers:**

(a) .....

(b) .....

2. Perform a linear regression on the data in the table, finding
- $y = ax + b$
- .

$x$	17	18	17	19	23	15	16
$y$	71.1	78.6	69.2	71.2	80.5	55.7	58.4

(a) Write down the value of  $a$ ,  $b$ . [3](b) Write down the correlation coefficient  $r$ . [1](c) Use your regression line to estimate  $y$  for  $x = 22$ . [2]**Working:****Answers:**

(a)(i) .....

(ii) .....

(b) .....

(c) .....

3. Find the solutions for the system, the value(s) for  $x$  such that  $f(x) = g(x)$ . Sketch the graph to show working.

(a)  $f(x) = -2x^2 + 5x + 7$

$y = -2x + 4$

[3]

**Working:**

**Answers:**

(a) .....

4. The data for  $n = 50$  are shown in the frequency table below.

$x$	$15 \leq x < 25$	$25 \leq x < 35$	$35 \leq x < 45$	$45 \leq x < 55$
Frequency	$k$	21	16	8

(a) Find the value of  $k$ . [1]

(b) Estimate the mean  $\bar{x}$ . [2]

(c) Estimate the standard deviation of the data,  $\sigma$ . [2]

**Working:**

**Answers:**

(a) .....

(b) .....

(c) .....