1 Amir, Bibi and Caitlyn are each given $1500 to invest.

(a) Amir invests his $1500 in an account which pays compound interest.
The interest rate is 3% per year for 5 years, after which it is 2% per year.

Find the value of Amir's investment at the end of 11 years.

$ ..... [3]

(b) Bibi invests her $1500 in an account which pays r % per year **simple** interest.
At the end of 11 years, the investment is worth $1962.

Calculate the value of r.

r = ... [3]

(c) Caitlyn invests her $1500 in an account which pays t % per year **compound** interest.
At the end of 11 years, the investment is worth $1968.13 .

Calculate the value of t.

t = ... [3]

2 (a) In **part (a)** enlargements and stretches have scale factors greater than 1.

(i) A transformation maps triangle A onto triangle B.
Triangle A is congruent to triangle B.

Tick all the possible transformations it could be.

Transformation	Tick (✔)
Rotation	
Reflection	
Translation	
Enlargement	
Stretch	

[1]

(ii) A transformation maps triangle *C* onto triangle *D*.
The angles of triangle *C* are the same as the corresponding angles of triangle *D*.

Tick all the possible transformations it could be.

Transformation	Tick (✔)
Rotation	
Reflection	
Translation	
Enlargement	
Stretch	

[1]

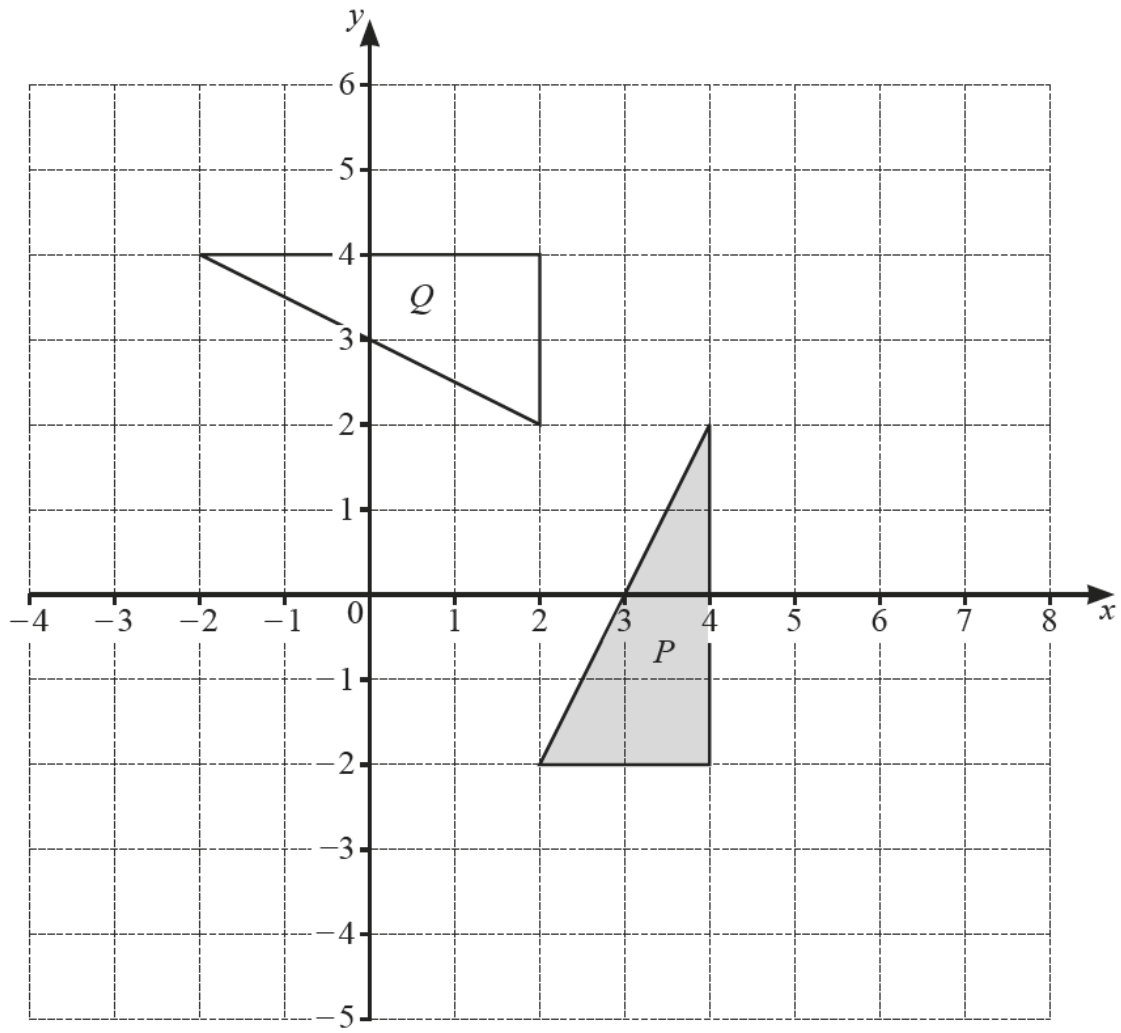
(iii) A transformation maps triangle *E* onto triangle *F*.
Triangle *F* has a larger area than triangle *E*.

Tick all the possible transformations it could be.

Transformation	Tick (✔)
Rotation	
Reflection	
Translation	
Enlargement	
Stretch	

[1]

(b)



(i) Describe fully the **single** transformation that maps triangle *P* onto triangle *Q*.

.....

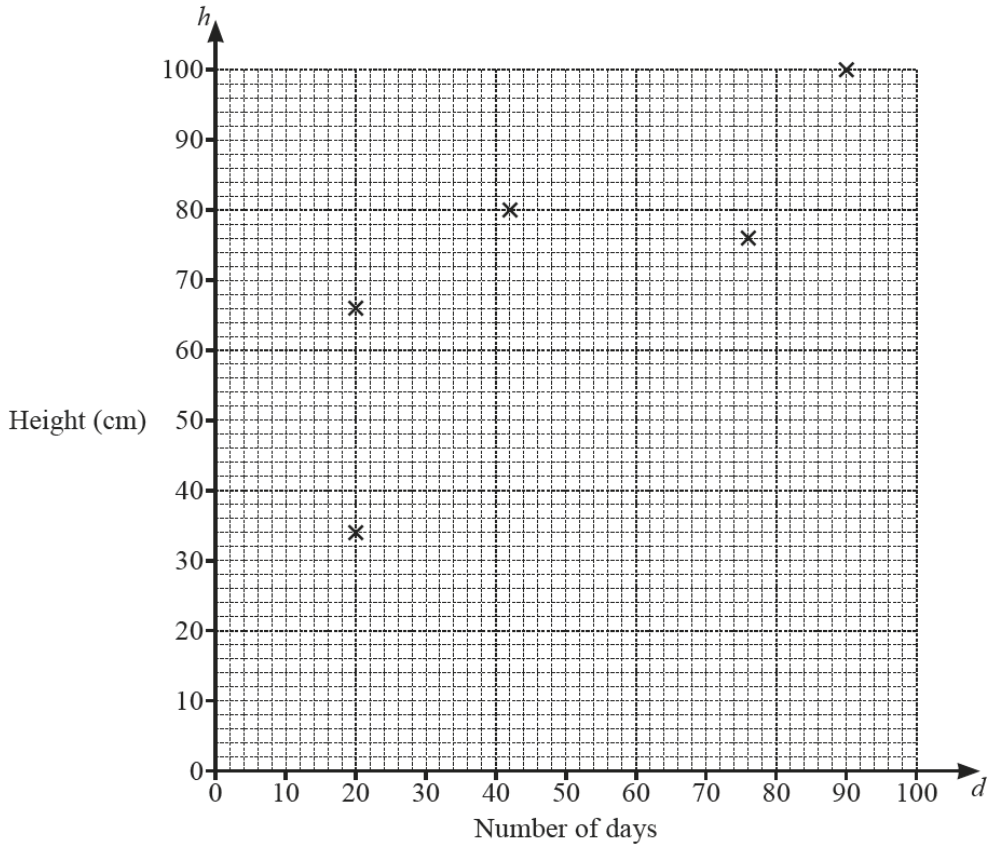
..... [3]

(ii) Stretch triangle *P* with the *x*-axis invariant and scale factor 2. [2]

3 The table shows the number of days, d, since planting and the heights, h cm, of some plants.

Number of days (d)	20	20	42	76	90	24	86	98	10	56
Height (h cm)	34	66	80	76	100	50	86	94	40	54

(a) Complete the scatter diagram.
The first five points have been plotted for you.



[2]

(b) What type of correlation is shown in the scatter diagram?

..... [1]

(c) Find the equation of the regression line for h in terms of d.

h = ... [2]

(d) Use your regression line to estimate the height of a plant that was planted 28 days ago.

..... cm [1]

(e) A plant was planted 140 days ago.

Explain why you should not use the equation of the regression line to estimate the height of this plant.

..... [1]

4 The table shows a set of data.

x	Frequency
5	16
6	18
7	25
8	11
9	6
10	4
Total	80

(a) When x represents the number of emails Essa receives each day, find

(i) the median,

..... [1]

(ii) the range,

..... [1]

(iii) the upper quartile,

..... [1]

(iv) the mean.

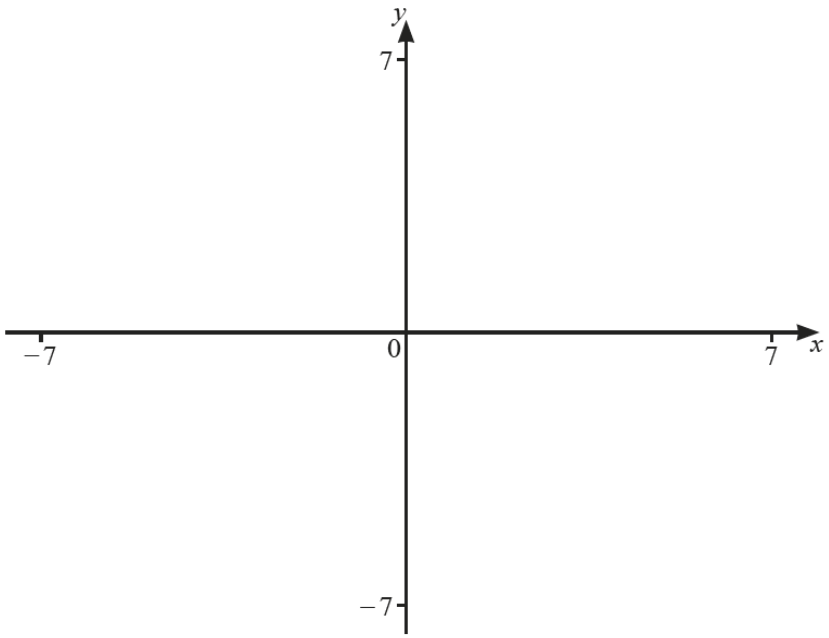
..... [2]

(b) When x represents the height of a seedling, correct to the nearest centimetre, explain why you cannot work out the range of the heights.

.....

..... [1]

5



$$f(x) = \frac{(2x^2 + 3)}{(x+1)(2-x)} \text{ for } -7 \leqslant x \leqslant 7$$

(a) On the diagram, sketch the graph of $y = f(x)$. [3]

(b) Write down the equation of each asymptote parallel to the y-axis.

..... [2]

(c) Write down the coordinates of the local minimum.

(..... , ...) [2]

(d) Find the range of values of x for which the gradient of $f(x)$ is negative.

..... [3]

(e) Solve $f(x) = -x$.

x = ... [1]