Question 1

Put one of the symbols $<$, $=$ or $>$ between $\frac{1}{6}$ and 17% to make a correct statement.

Answer $\frac{1}{6}$ ....17%   [1]

Question 2

(a) Calculate $(4.74^2 + 6.29^2)^3$,   writing down your full calculator display.

Answer (*a*) .... [1]

(b) Round your answer to part **(a)** to 2 significant figures.

Answer (*b*) .... [1]

Question 3

Work out $\left(\frac{0.07728}{27\,600}\right)^2$, giving your answer in standard form.

Answer.. [2]

Question 4

Simplify $12x^{10} \times 3x^4$.

Answer .... [2]

Question 5

Write down the value of 3^{-3}, giving your answer as a **fraction**.

Answer .... [2]

Question 6

Alexia invests \$380 for 6 years at 5% per year simple interest.
How much interest does she receive?

Answer \$.. [2]

Question 7

In April 1998, one US dollar was worth 128.65 Japanese Yen.
Tomoaki changed 20 000 Yen into dollars.
How much did he receive? Give your answer correct to 2 decimal places.

Answer ....dollars [2]

Question 8

The Earth is 1.5×10^8 kilometres from the Sun.
Light from the Sun takes 8 minutes to reach the Earth.
Jupiter is 7.78×10^8 kilometres from the Sun.
Work out how long it takes light from the Sun to reach Jupiter.

Answer .... minutes [2]

Question 9

-5	0	5	10	15	20	25	30	35	40	45	50	°Fahrenheit
-20		-15		-10		-5		0		5		10 °Celsius
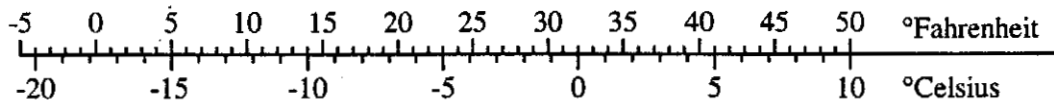
The diagram shows two temperature scales, Fahrenheit and Celsius, alongside each other.

(a) What temperature on the Celsius scale is equivalent to 0° on the Fahrenheit scale?
   Give the answer correct to the nearest degree.

   Answer (a) ....°C   [1]

(b) The temperature rises from –15° Celsius to 10° Celsius.
   How many degrees is this on

   (i)   the Celsius scale,

   Answer (b)(i) ....°C   [1]

   (ii)   the Fahrenheit scale?

   Answer (b)(ii) ....°F   [1]

Question 10

(a) A piece of rope is 70 m long, to the nearest metre.
   Complete the statement about the length of the rope.

   Answer (a) ....m ≤ length < ....m   [2]

(b) Another piece of rope is 9 metres long, to the nearest 10 **centimetres**.
   Write down the shortest possible length of this piece of rope.

   Answer (b) ....m   [1]

Question 11

(a) Factorise completely $2x^2 - 6x$.

   Answer (a) ....   [2]

(b) Find the value of $2x^2 - 6x$ when $x = 3$.

   Answer (b) ....   [1]

Question 12

Solve the simultaneous equations $x + 2y = 1,$
$x + 4y = 5.$

Answer $x = $ ....

$y = $ .... [3]

Question 13

Solve the equations

(a) $5x - 3 = 42,$

Answer (a) $x = $ .... [2]

(b) $5(x - 3) = 20.$

Answer (b) $x = $ .... [2]

Question 14
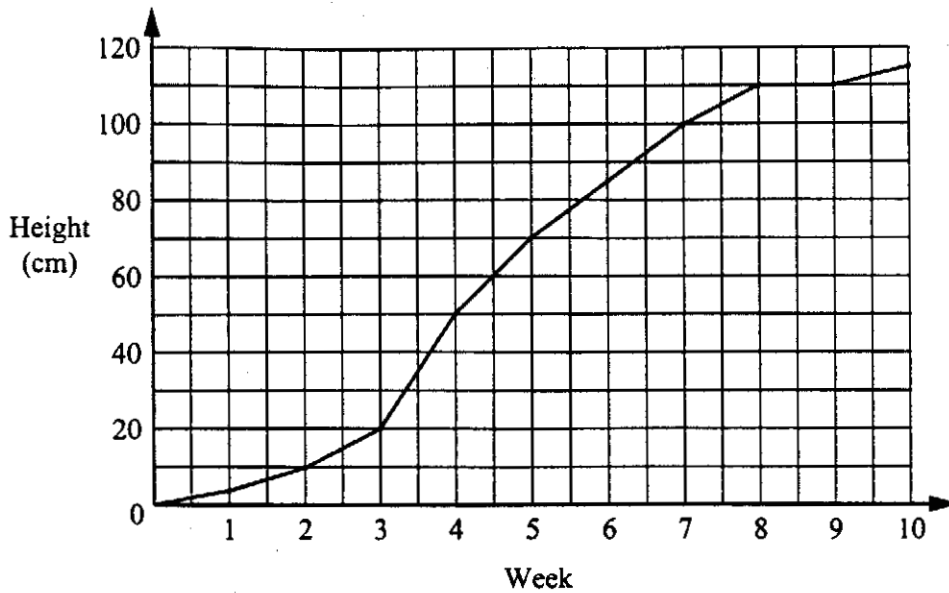
The graph shows the height of a tomato plant which was measured at the end of each week for 10 weeks. For example, at the end of week 2 the height of the plant was 10 cm.

(a) What was the height of the plant at the end of week 4?

Answer (a) .... cm   [1]

(b) Estimate the height of the plant after $6\frac{1}{2}$ weeks.

Answer (b) .... cm   [1]

(c) How many centimetres did the plant grow between the end of week 5 and the end of week 7?

Answer (c) .... cm   [1]

(d) During which week did the plant grow most?

Answer (d) Week ....   [1]

Question 15

(a) Complete the table of values for $y = x^2 - 4x$.

x	-2	-1	0	1	2	3	4	5	6
y		5	0		-4	-3	0		

[3]

(b) On the grid below, plot these points and then draw the graph of $y = x^2 - 4x$ for $-2 \leqslant x \leqslant 6$.
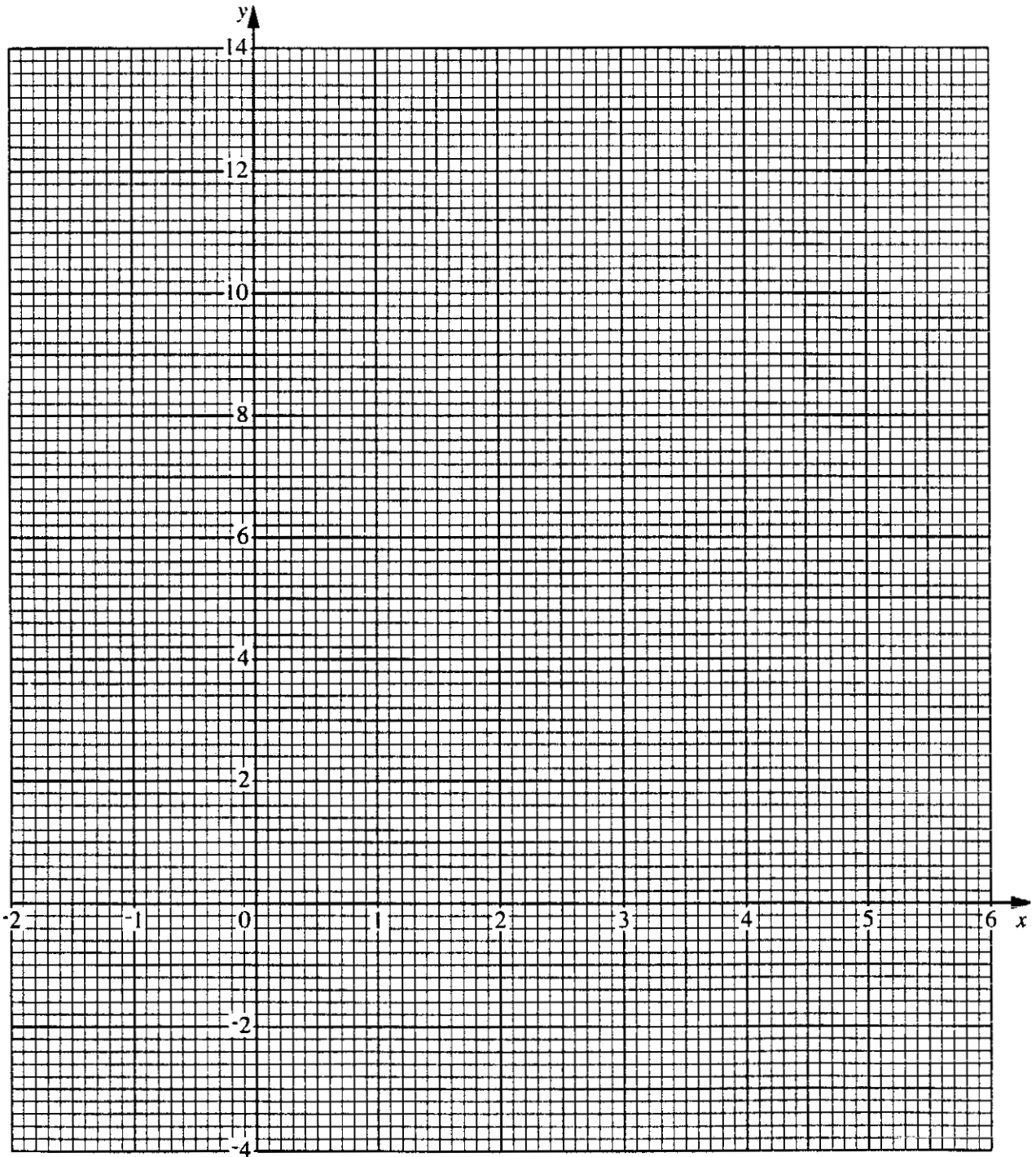
[4]

Question 15

(c) Use your graph to find the two values of x when $x^2 - 4x = 2$.

Answer (c) $x =$ .... and .... [2]

(d) Complete the table of values for $y = 3 - x$.

x	-2	2	6
y			

[2]

(e) On the same grid, draw the graph of $y = 3 - x$ for $-2 \leqslant x \leqslant 6$. [2]

(f) Write down the coordinates of the two points where the graphs intersect.

Answer (f) $(..........,..........)$ and $(..........,..........)$ [2]

QUESTION	ANSWER	MARK	
1	<	1	
2 (a)	238693.7513	1	Accept any equivalent, but must be ≥ 6 sig figs
(b)	240000	1	√ from (a)
3	7.84 x 10^{-12}	2	(SC1) for figures 784
4	$36x^{14}$	2	Must be in form mx^n. (B1) for 36 and (B1) for 14
5	$\frac{1}{27}$	2	(B1) for $\frac{1}{3^3}$ or $\left(\frac{1}{3}\right)^3$ or 0.037(037…) or $\frac{37}{1000}$
6	114	2	(M1) for 380 x 5 x 6 ÷ 100
7	155.46	2	Correct answer only (M1) for 20000 ÷ 128.65
8	41.5	2	(M1) for 7.78 x 8 ÷ 1.5 seen or equivalent
9 (a)	-17.8	1	Correct answer only
(b)(i)	25	1	Correct answer only
(b)(ii)	45	1	Correct answer only
10 (a)	69.5 70.5	1, 1	Correct but reversed answers score 1 mark
(b)	8.95	1	
11 (a)	$2x(x-3)$	2	(B1) for $2(x^2 - 3x)$ or $x(2x-6)$
(b)	0	1	
12	x = -3 y = 2	3	(M1) for correct method (A1) for either correct answer
13 (a)	9	2	(B1) for $5x = 45$
(b)	7	2	(B1) for $x - 3 = 4$
14 (a)	50	1	Correct answer only
(b)	92 to 94	1	
(c)	30	1	Correct answer only
(d)	4	1	Correct answer only
15 (a)	<table><tr><td>x</td><td>-2</td><td>1</td><td>5</td><td>6</td></tr><tr><td>y</td><td>12</td><td>-3</td><td>5</td><td>12</td></tr></table>	3	(T2) for 3 correct y values (T1) for 2 correct y values Mark the table – no feedback from the graph

QUESTION	ANSWER	MARK	
(b)	9 correct or √ correct plots Tolerance 1mm	3	(P2) for 7 or 8 correct or √ correct plots (P1) for 5 or 6 correct or √ correct plots
	Reasonably correct curve	1	Not more than 1mm from the 9 correct points No double lines or an unduly thick line for the curve Condone ruled line for -2≤x≤-1 and for 5≤x≤6 but not elsewhere
(c)	-0.5 to -0.4 and 4.4 to 4.5	1, 1	Allow calculation of roots If coordinates given, mark x values If more than 2 roots given, mark any incorrect ones
(d)		x	-2	2	6		y	5	1	-3		2	(T1) for 2 correct y values Mark the table – no feedback from the graph
(e)	Correct, ruled straight line	2	Line must be at least 8cm long (L1) for intention to draw a single straight line (not horizontal or vertical) through two (or three) of 'his' points.
(f)	(-0.85 to -0.75, 3.75 to 3.95) and (3.75 to 3.85, -0.85 to -0.75)	1 1	If no marks earned, award (SC1) for any two of the four coordinates correct.

TYPES OF MARK

Most of the marks (those without prefixes and 'B' marks) are given for accurate results, drawings or statements.
'M' marks are awarded for any correct method applied to the appropriate numbers.
'B' marks are given for a correct statement or step.
'A' marks are for accurate results or statements but are awarded only if the relevant 'M' marks have been earned.
'SC' marks are awarded in special cases.
'P' marks are for plotting co-ordinates accurately.
'L' marks are for drawing a straight line with a ruler.
'T' marks are for completing values in a table
The symbol '√' indicates that a previous error is to be 'followed through' i.e. the mark can be gained if the candidate has made no further error in obtaining the relevant result.