# Equation of a Straight Line Exam Practice

Q1. Find an equation of the line which passes through the point P where P = (0, 5) and has gradient 3.

$y = mx + c$ ; m is gradient, y is y-intercept

$y = 3x + 5$

Answer: $y = 3x + 5$

(2 marks)

Q2. A line passes through the points A = (0, -2) and B = (8, -4). Work out an equation of the line.

$y = mx + c$

$m = \frac{-4 - -2}{8 - 0}$

$= \frac{-2}{8}$

$= -\frac{1}{4}$

$y = -\frac{1}{4}x - 2$

Answer: $y = -\frac{1}{4}x - 2$

(2 marks)

Q3. A line passes through the points C = (3, -2) and D = (7, 10). Work out an equation of the line.

$y = mx + c$

$m = \frac{10 - -2}{7 - 3}$

$= \frac{12}{4}$

$= 3$

Choosing point C to find y-intercept:

$-2 = 3(3) + c$

$\rightarrow c = -11$

Answer: $y = 3x - 11$

(2 marks)

Q4. Write down the gradient and y-intercept of the line which has equation $y = -2x - 7$

$m = -2$

y-intercept is $-7$

Answer: grad $-2$, y-int is $-7$

(2 marks)

Q5. Find the gradient and y-intercept of the line which has equation $2y - 6x = 8$

$2y = 6x + 8$

$y = 3x + 4$

gradient $= 3$, y-intercept $= 4$

Answer: grad 3; y-int. 4

(2 marks)

Q6. A line $L$ has equation $4y = -6x + 11$

(i) Work out the gradient of the line $L$.

$y = -\frac{6}{4} + \frac{11}{4}$

gradient is $-\frac{3}{2}$

Answer: $-\frac{3}{2}$

(2 marks)

(ii) Find the co-ordinates of the point where the line $L$ crosses the $x$-axis

$4y = -6x + 11$. Let $L$ cross $x$-axis at $(x, 0)$.

$0 = -6x + 11$

$x = \frac{11}{6}$

Answer: $(\frac{11}{6}, 0)$

(2 marks)

Q7. A line $L$ has equation $10x - 2y - 9 = 0$

(i) Work out the gradient of the line $L$.

$10x - 9 = 2y$

gradient is $\frac{10}{2} = 5$

Answer: 5

(2 marks)

(ii) Write down an equation of a line parallel to line L.

L is $2y = 10x - 9$.

A parallel line is $2y = 10x + 2$

(or anything of the form $2y = 10x + k$ for some number $k$)

Answer: $2y = 10x + k$

(1 mark)

(iii) Is the point (-1, -9) on the line L? Justify your answer.

L is $2y = 10x - 9$ so is into this $(\overset{x}{-1}, \overset{y}{-9})$:

$-18 \overset{?}{=} 10(-1) - 9$

$-18 \neq -19$ so no it is not.

Answer: not.

(2 marks)

Q8. A line $L$ has equation $cy + ax = b$ where a, b and c are non-zero numbers.

(i) Work out the gradient of the line $L$.

$cy = -ax + b$

$\Rightarrow y = -\frac{a}{c}x + \frac{b}{c}$

$\Rightarrow$ gradient is $-\frac{a}{c}$

Answer: $-\frac{a}{c}$

(2 marks)

(ii) Find the co-ordinates of the point where the line $L$ crosses the $y$-axis

$y = -\frac{a}{c}x + \frac{b}{c}$

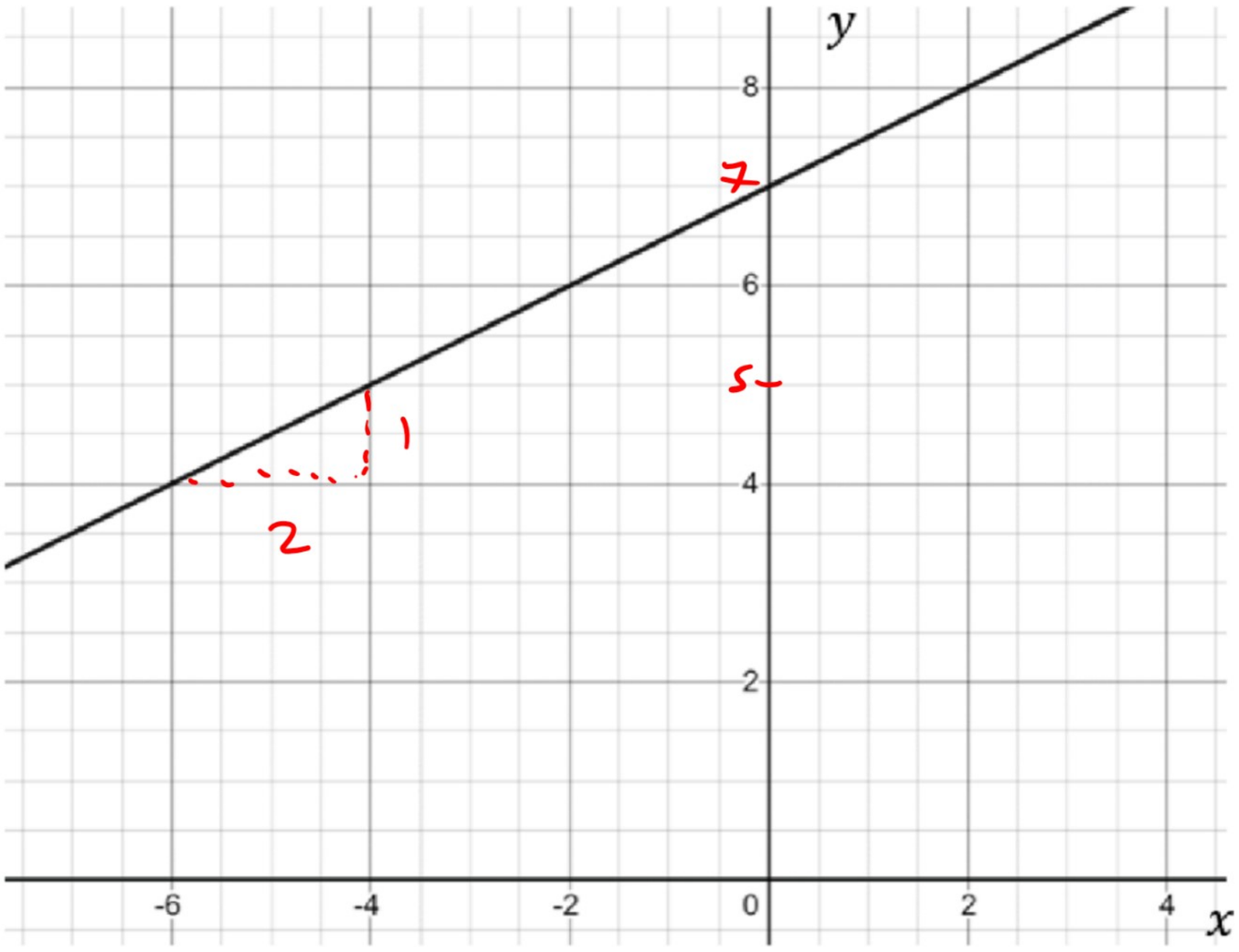
$\Rightarrow$ y-intercept is $\frac{b}{c}$

$(0, \frac{b}{c})$ is where $L$ crosses y-axis

Answer: $(0, \frac{b}{c})$

(1 mark)

Q9. Find the equation of the lines shown:




$m = \frac{1}{2}$

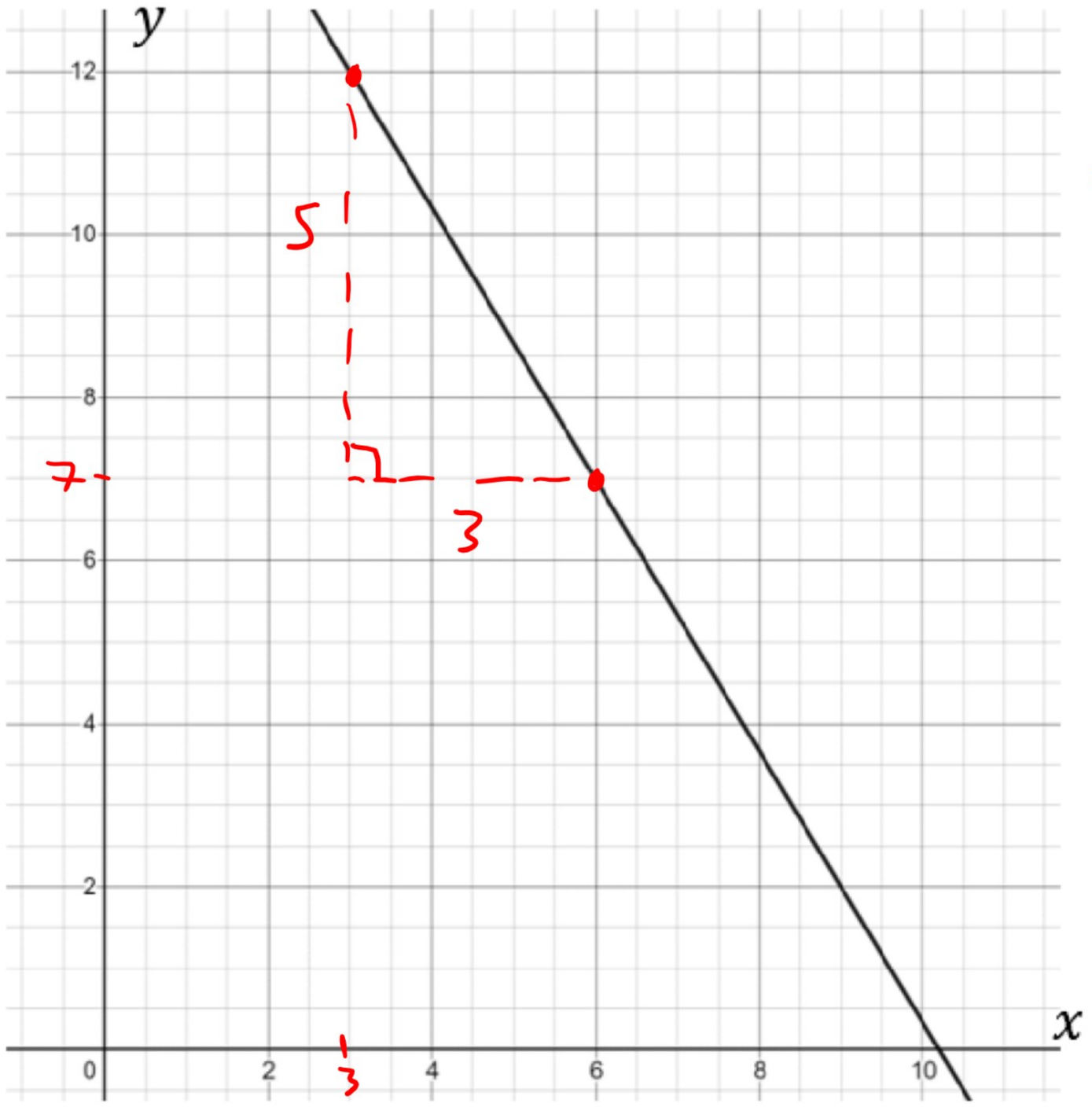
$c = 7$

$\Rightarrow y = \frac{1}{2}x + 7$

Answer: $y = \frac{1}{2}x + 7$

(2 marks)

Q10. Find the equation of the line shown:




$m = -\frac{5}{3}$

$y = -\frac{5}{3}x + c$

subs. in (3,12) for example

$12 = -\frac{5}{3}(3) + c$

$\Rightarrow 12 = -5 + c$

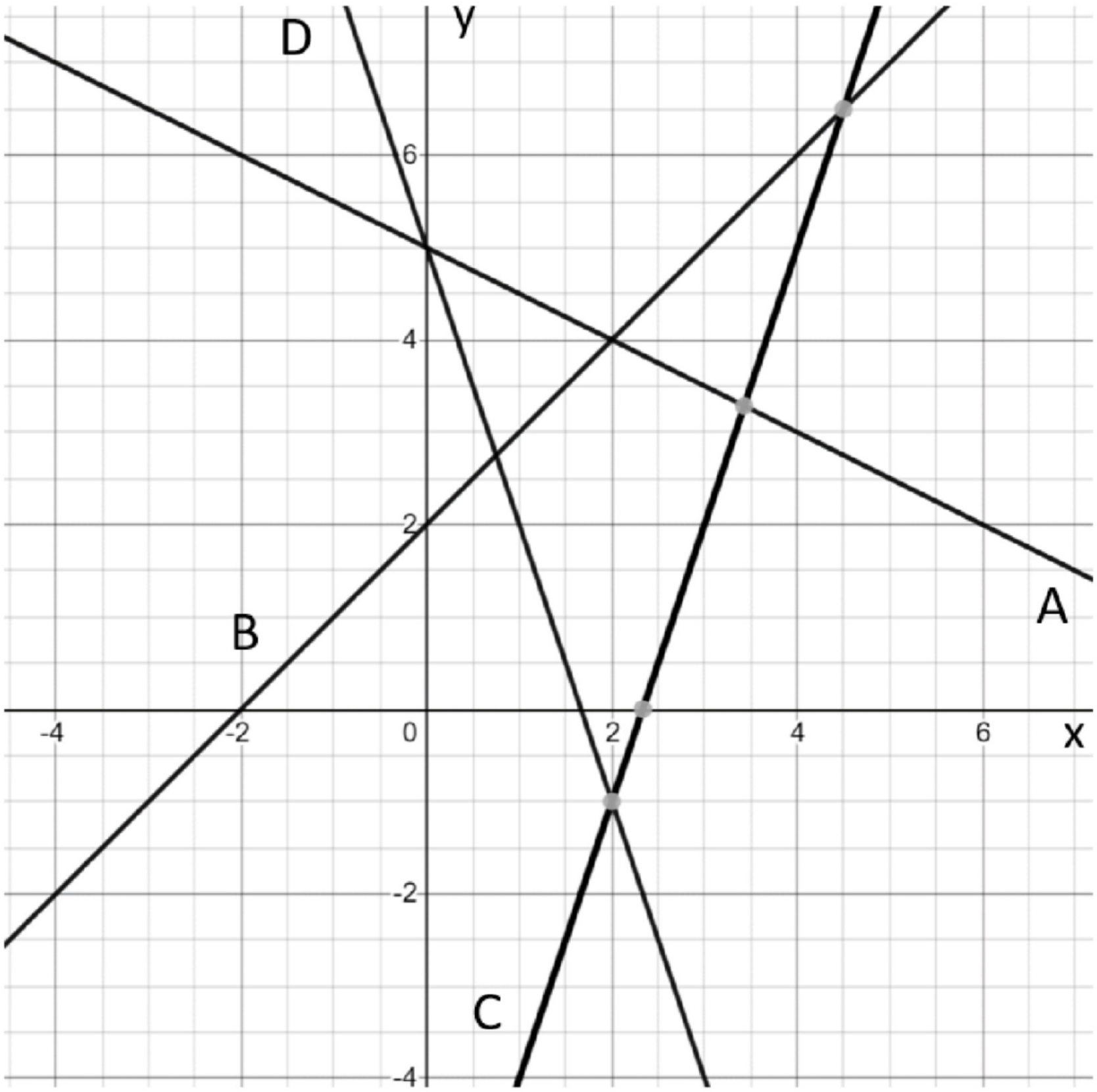
$c = 17$

$y = -\frac{5}{3}x + 17$

Answer: $y = -\frac{5}{3}x + 17$

(2 marks)

Q11. Label each equation with the letter of the line it corresponds to.




1. $y = x + 2$ B

2. $y = -3x + 5$ D

3. $y = -\frac{1}{2}x + 5$ A

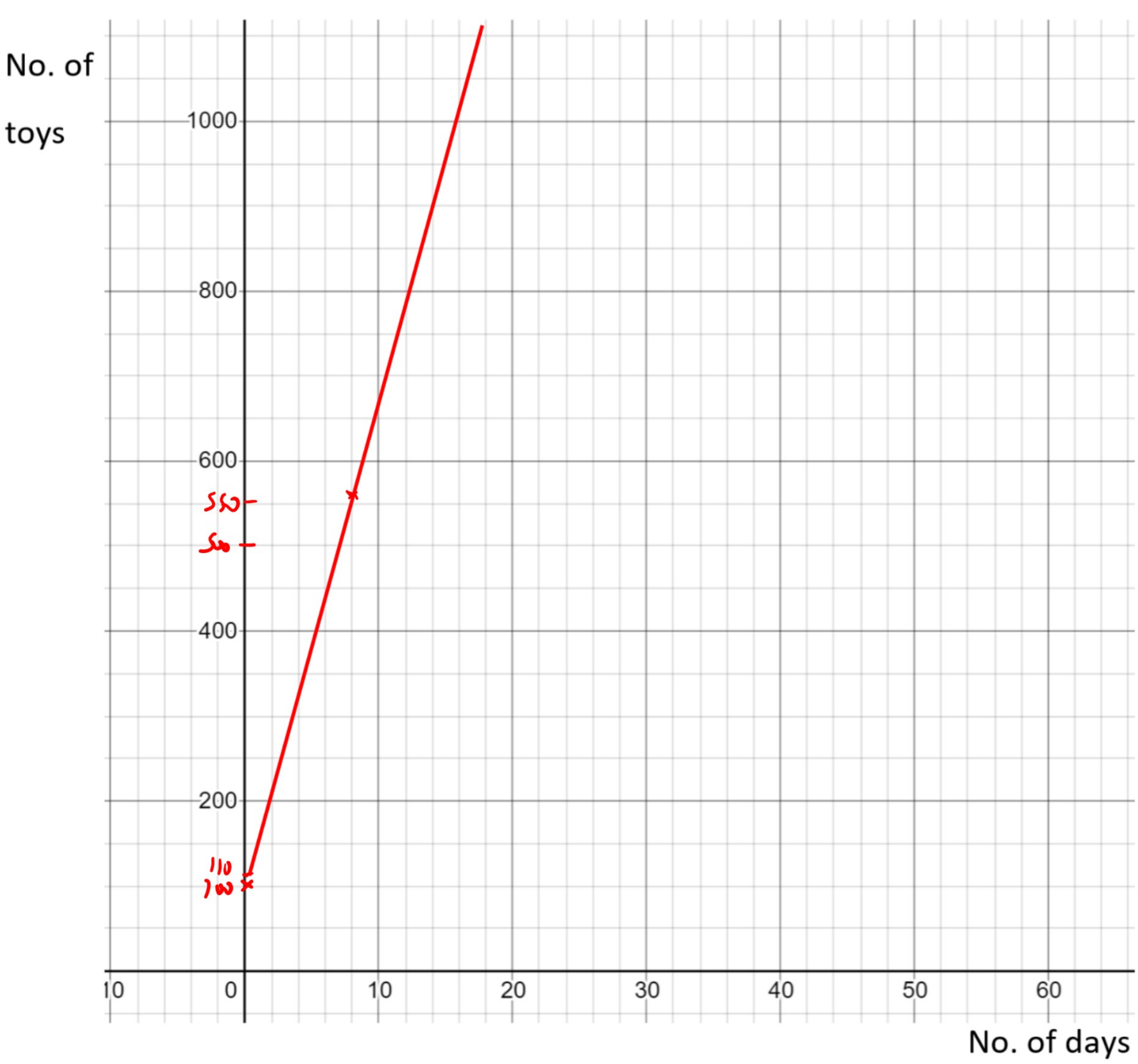
4. $y = 3x - 7$ C

Answer: _____

(3 marks)

Q12. At a new factory, the daily number of toys produced has increased by 50 each day. On the $9^{th}$ day, the number of toys produced was 560.

Draw a straight line on the graph to show this information.




- 'Day 0' is y-intercept and is $560 - 9 \times 50$
  $= 560 - 450$
  $= 110$
- (Note the line must not be drawn inside the negative half of the plane)

Answer: _____

(2 marks)