Recognise and use the line $y = x$

1 On the line $y = x$, the y-coordinate is equal to the x-coordinate.
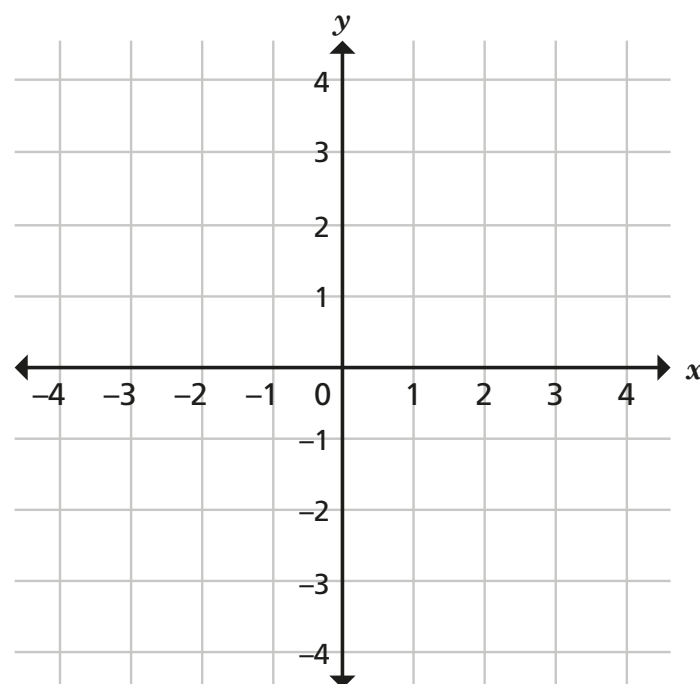
a) Complete the table of values for $y = x$.

x	−1	0		2	
y		0	1		3

b) Write the values in the table as coordinates.

(−1, ☐), (0, 0), (☐ , 1), (2, ☐), (☐ , 3)

c) Plot the points.

d) Join the points to make the line $y = x$.

e) Is the point (3, 4) above or below the line $y = x$? _____

2 Are these statements always true, sometimes true or never true.

Give a reason for your answer.

a) The line $y = x$ is the same as the line $x = y$.

_____

_____

b) The line $y = x$ is at 45° to the x-axis.

_____

_____

c) The line $y = x$ passes through the 4th quadrant.

_____

_____

3 Tick the coordinates that lie on the line $y = x$.
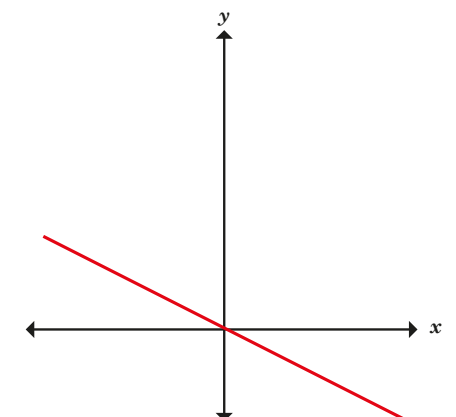
(5.6, 5.6) ☐   ($3a$, $a + 2a$) ☐

(120, 60^2) ☐   (0.3, $\frac{1}{3}$) ☐

4 Give a reason why each graph is not the line $y = x$.

a)
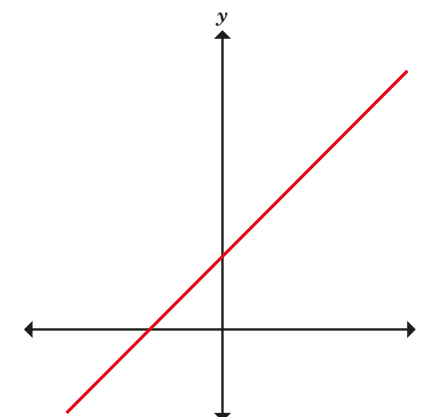
b)

_____   _____

_____   _____

5 The points D(0, 0), E(4, 0) and F(4, 4) join to make the triangle DEF.

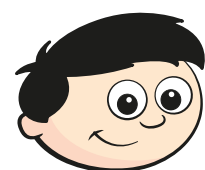a) What is the equation of the line that passes through these points?
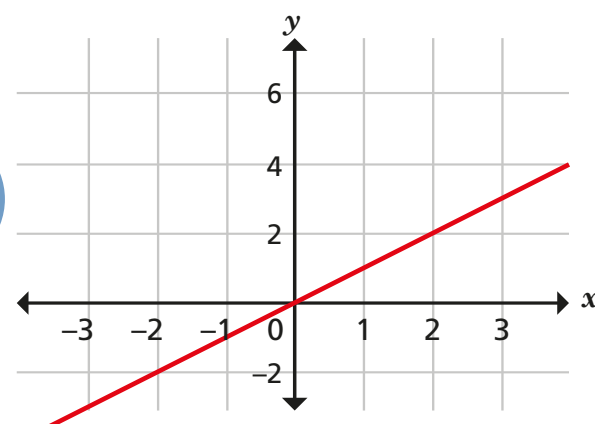
E and F _____

D and E _____

F and D _____

b) Find the area of the enclosed triangle.

_____

6

This graph of $y = x$ has been plotted wrong because it is not steep enough.

Explain why Dexter is wrong.

_____

_____

_____

7 Which of these is not the line $y = x$?
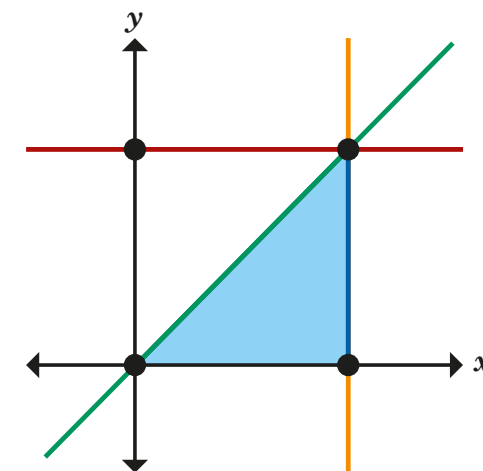
$y - x = 0$ ☐ $3x = 3y$ ☐

$x + y = 0$ ☐ $y = x + 0$ ☐

8 The lines $y = x$ and $x = a$ enclose a triangle with the x- and y-axes.

a) Find the area of the triangle when $a = 5$

_____

b) If the area of the triangle is 50, what is the value of a?

_____

_____

c) Write a formula for the area of the triangle.

_____