

EXERCISE 2.2 - COMPLETE SOLUTIONS

— Question 1: Find the point of intersection of the coordinate axes and the following linear functions graphically

(i) $y = -5x + 10$

Step 1: Find x-intercept (where $y = 0$)

- $0 = -5x + 10$
- $5x = 10$
- $x = 2 \rightarrow \text{Point: } (2, 0)$

Step 2: Find y-intercept (where $x = 0$)

- $y = -5(0) + 10$
- $y = 10 \rightarrow \text{Point: } (0, 10)$

Step 3: Intersection with coordinate axes

- **x-intercept:** $(2, 0)$
- **y-intercept:** $(0, 10)$

x	y
0	10
2	0

(ii) $y = 2x - 1$

Step 1: Find x-intercept (where $y = 0$)

- $0 = 2x - 1$
- $2x = 1$
- $x = 1/2 \rightarrow \text{Point: } (1/2, 0)$

Step 2: Find y-intercept (where $x = 0$)

- $y = 2(0) - 1$
- $y = -1 \rightarrow \text{Point: } (0, -1)$

Step 3: Intersection with coordinate axes

- **x-intercept:** $(1/2, 0)$
- **y-intercept:** $(0, -1)$

x	y
0	-1
1/2	0

(iii) $y = x - 3$

Step 1: Find x-intercept (where $y = 0$)

- $0 = x - 3$

- $x = 3 \rightarrow$ Point: $(3, 0)$

Step 2: Find y-intercept (where $x = 0$)

- $y = 0 - 3$
- $y = -3 \rightarrow$ Point: $(0, -3)$

Step 3: Intersection with coordinate axes

- **x-intercept:** $(3, 0)$
- **y-intercept:** $(0, -3)$

x	y
0	-3
3	0

(iv) $y = 3x + 2$

Step 1: Find x-intercept (where $y = 0$)

- $0 = 3x + 2$
- $3x = -2$
- $x = -2/3 \rightarrow$ Point: $(-2/3, 0)$

Step 2: Find y-intercept (where $x = 0$)

- $y = 3(0) + 2$
- $y = 2 \rightarrow$ Point: $(0, 2)$

Step 3: Intersection with coordinate axes

- **x-intercept:** $(-2/3, 0)$
- **y-intercept:** $(0, 2)$

x	y
0	2
-2/3	0

Summary Table for Question 1:

Function	x-intercept	y-intercept
$y = -5x + 10$	$(2, 0)$	$(0, 10)$
$y = 2x - 1$	$(1/2, 0)$	$(0, -1)$
$y = x - 3$	$(3, 0)$	$(0, -3)$
$y = 3x + 2$	$(-2/3, 0)$	$(0, 2)$

Question 2: Find the point(s) of intersection of the following functions graphically

(i) $f(x) = 2x + 5$, $g(x) = -x + 5$

Step 1: Set $f(x) = g(x)$ to find x-coordinate of intersection

- $2x + 5 = -x + 5$
- $2x + x = 5 - 5$
- $3x = 0$
- $x = 0$

Step 2: Find y-coordinate by substituting $x = 0$ into either function

- $f(0) = 2(0) + 5 = 5$
- $g(0) = -0 + 5 = 5$

Step 3: Point of intersection

- **(0, 5)**

x	$f(x) = 2x + 5$	$g(x) = -x + 5$
0	5	5
1	7	4
-1	3	6

Answer: Intersection point = (0, 5)

(ii) $f(x) = 3x - 2$, $g(x) = 10 - x$

Step 1: Set $f(x) = g(x)$ to find x-coordinate of intersection

- $3x - 2 = 10 - x$
- $3x + x = 10 + 2$
- $4x = 12$
- $x = 3$

Step 2: Find y-coordinate by substituting $x = 3$ into either function

- $f(3) = 3(3) - 2 = 9 - 2 = 7$
- $g(3) = 10 - 3 = 7$

Step 3: Point of intersection

- **(3, 7)**

x	$f(x) = 3x - 2$	$g(x) = 10 - x$
3	7	7
0	-2	10
4	10	6

Answer: Intersection point = (3, 7)

Summary Table for Question 2:

Functions	Intersection Point
$f(x) = 2x + 5$, $g(x) = -x + 5$	(0, 5)
$f(x) = 3x - 2$, $g(x) = 10 - x$	(3, 7)

Final Answer Key:**Q1 (i):** x-intercept = (2, 0), y-intercept = (0, 10)**Q1 (ii):** x-intercept = (1/2, 0), y-intercept = (0, -1)**Q1 (iii):** x-intercept = (3, 0), y-intercept = (0, -3)**Q1 (iv):** x-intercept = (-2/3, 0), y-intercept = (0, 2)**Q2 (i):** Intersection = (0, 5)**Q2 (ii):** Intersection = (3, 7)**EXERCISE 2.2 - COMPLETE SOLUTIONS****Question 1: Find the point of intersection of the coordinate axes and the following linear functions graphically****(i) $y = -5x + 10$** **Step 1: Find x-intercept** (where $y = 0$)

- $0 = -5x + 10$
- $5x = 10$
- $x = 2 \rightarrow$ Point: (2, 0)

Step 2: Find y-intercept (where $x = 0$)

- $y = -5(0) + 10$
- $y = 10 \rightarrow$ Point: (0, 10)

Step 3: Intersection with coordinate axes

- x-intercept: (2, 0)
- y-intercept: (0, 10)

x	y
0	10
2	0

(ii) $y = 2x - 1$ **Step 1: Find x-intercept** (where $y = 0$)

- $0 = 2x - 1$
- $2x = 1$
- $x = 1/2 \rightarrow$ Point: (1/2, 0)

Step 2: Find y-intercept (where $x = 0$)

- $y = 2(0) - 1$
- $y = -1 \rightarrow$ Point: (0, -1)

Step 3: Intersection with coordinate axes

- x-intercept: (1/2, 0)
- y-intercept: (0, -1)

x	y
0	-1
1/2	0

(iii) $y = x - 3$

Step 1: Find x-intercept (where $y = 0$)

- $0 = x - 3$
- $x = 3 \rightarrow$ Point: $(3, 0)$

Step 2: Find y-intercept (where $x = 0$)

- $y = 0 - 3$
- $y = -3 \rightarrow$ Point: $(0, -3)$

Step 3: Intersection with coordinate axes

- x-intercept: $(3, 0)$
- y-intercept: $(0, -3)$

x	y
0	-3
3	0

(iv) $y = 3x + 2$

Step 1: Find x-intercept (where $y = 0$)

- $0 = 3x + 2$
- $3x = -2$
- $x = -2/3 \rightarrow$ Point: $(-2/3, 0)$

Step 2: Find y-intercept (where $x = 0$)

- $y = 3(0) + 2$
- $y = 2 \rightarrow$ Point: $(0, 2)$

Step 3: Intersection with coordinate axes

- x-intercept: $(-2/3, 0)$
- y-intercept: $(0, 2)$

x	y
0	2
-2/3	0

Summary Table for Question 1:

Function	x-intercept	y-intercept
$y = -5x + 10$	$(2, 0)$	$(0, 10)$

Function	x-intercept	y-intercept
$y = 2x - 1$	$(1/2, 0)$	$(0, -1)$
$y = x - 3$	$(3, 0)$	$(0, -3)$
$y = 3x + 2$	$(-2/3, 0)$	$(0, 2)$

Question 2: Find the point(s) of intersection of the following functions graphically

(i) $f(x) = 2x + 5$, $g(x) = -x + 5$

Step 1: Set $f(x) = g(x)$ to find x-coordinate of intersection

- $2x + 5 = -x + 5$
- $2x + x = 5 - 5$
- $3x = 0$
- $x = 0$

Step 2: Find y-coordinate by substituting $x = 0$ into either function

- $f(0) = 2(0) + 5 = 5$
- $g(0) = -0 + 5 = 5$

Step 3: Point of intersection

- $(0, 5)$

x	$f(x) = 2x + 5$	$g(x) = -x + 5$
0	5	5
1	7	4
-1	3	6

Answer: Intersection point = $(0, 5)$

(ii) $f(x) = 3x - 2$, $g(x) = 10 - x$

Step 1: Set $f(x) = g(x)$ to find x-coordinate of intersection

- $3x - 2 = 10 - x$
- $3x + x = 10 + 2$
- $4x = 12$
- $x = 3$

Step 2: Find y-coordinate by substituting $x = 3$ into either function

- $f(3) = 3(3) - 2 = 9 - 2 = 7$
- $g(3) = 10 - 3 = 7$

Step 3: Point of intersection

- $(3, 7)$

x	$f(x) = 3x - 2$	$g(x) = 10 - x$
3	7	7
0	-2	10

x	$f(x) = 3x - 2$	$g(x) = 10 - x$
4	10	6

Answer: Intersection point = (3, 7)

Summary Table for Question 2:

Functions	Intersection Point
$f(x) = 2x + 5, g(x) = -x + 5$	(0, 5)
$f(x) = 3x - 2, g(x) = 10 - x$	(3, 7)

Final Answer Key:

Q1 (i): x-intercept = (2, 0), y-intercept = (0, 10)

Q1 (ii): x-intercept = (1/2, 0), y-intercept = (0, -1)

Q1 (iii): x-intercept = (3, 0), y-intercept = (0, -3)

Q1 (iv): x-intercept = (-2/3, 0), y-intercept = (0, 2)

Q2 (i): Intersection = (0, 5)

Q2 (ii): Intersection = (3, 7)