Objective functions

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. A has unit revenue 35 and cost 23; B has revenue 28 and cost 19. Write profit. [2 marks]

Subtract each unit cost from revenue first.

Answer: $P = 12x + 9y$.

2. Evaluate $C = 8x + 13y$ at $(4, 3)$. [2 marks]

$32 + 39 = 71$.

Answer: 71.

3. At vertices $(0, 0), (8, 0), (4, 5), (0, 7)$, maximise $P = 3x + 4y$. [2 marks]

The values are 0,24,32,28.

Answer: Maximum 32 at $(4, 5)$.

4. At vertices $(2, 3), (7, 3), (4, 6)$, minimise $C = 5x + 2y$. [2 marks]

The values are 16,41,32.

Answer: Minimum 16 at $(2, 3)$.

5. Does subtracting a fixed AUD 100 change the maximiser of $P = 7x + 5y$? [2 marks]

All objective values decrease equally, preserving their order.

Answer: No, if the feasible set stays unchanged.

6. Why does every point from $(0, 6)$ to $(6, 0)$ have the same $P = 2x + 2y$? [2 marks]

On that edge $x + y = 6$, so $P = 2(x + y) = 12$.

Answer: Each has $P = 12$.