

LC 2018: PAPER 2**QUESTION 1 (25 MARKS)****Question 1 (a)**Let x = Mary's net winnings

	First	Second	Third	No place
x (€)	7000	5000	1000	-2000
$P(x)$	$\frac{1}{20}$	$\frac{1}{10}$	$\frac{1}{4}$	$\frac{3}{5}$

$$E(x) = \sum xP(x) = 7000 \times \frac{1}{20} + 5000 \times \frac{1}{10} + 1000 \times \frac{1}{4} - 2000 \times \frac{3}{5} = -100$$

ANSWER: Mary's expected loss is €100.

MARKING SCHEME NOTES**Question 1 (a) [Scale 15C (0, 4, 11, 15)]**4: • $E(x)$ partially formulated (1 or 2 terms)11: • $E(x)$ fully formulated (sum of all three/all four terms)**Question 1 (b)**

	First	Second	Third	No place
x (€)	$7000 + x$	$5000 + x$	$1000 + x$	-2000
$P(x)$	$\frac{1}{20}$	$\frac{1}{10}$	$\frac{1}{4}$	$\frac{3}{5}$

$$E(x) = \sum xP(x) = (7000 + x) \times \frac{1}{20} + (5000 + x) \times \frac{1}{10} + (1000 + x) \times \frac{1}{4} + (-2000) \times \frac{3}{5} = 0$$

$$7000 + x + 2(5000 + x) + 5(1000 + x) + 12(-2000) = 0$$

$$7000 + x + 10\,000 + 2x + 5000 + 5x - 24\,000 = 0$$

$$8x = 2000$$

$$\therefore x = \text{€}250$$

MARKING SCHEME NOTES**Question 1 (b) [Scale 10D (0, 3, 5, 8, 10)]**3: • Any relevant use of x 5: • $E(x)$ fully formulated (LHS)8: • Relevant equation in x