Detailed Marking Instructions for each question

Question	Expected Answer(s) Give one mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
1.	**Ans: No, supported by working** •[1] Process: calculate fraction of •[2] Communication: state conclusion	**2**	 •[1] 3/8 × 280 = 105 •[2] 105 < 110

Notes:

- Correct method with incorrect answer →'correct' conclusion — award 1/2
- Use of 'km' in conclusion instead of 'miles' — award 2/2
- Incorrect fraction used eg: 4/9 × 280 = 124(.444..) →'enough fuel' — award 1/2
- 3/9 × 280 = 93(.333..) →'not enough fuel' — award 1/2
- Correct conclusion with no working shown — award 1/2
- ½ × 280 = 140 →enough fuel (working significantly eased) — award 0/2

2.	**Ans: 0310/3·10am** •[1] Strategy: knows how to deal with time zone, flight time and security clearance •[2] Process/communication: state time	**2**	 •[1] Evidence of adding all three times in the question on to 1845 •[2] 0310

Notes:

- If any two out of the three times are added correctly — award 1/2
- An answer of 'pick up from 0310 to 0315' — award 2/2

Special case:

Candidate subtracts 4 hour time difference instead of adding → pick Usain up at 1910 — award 1/2

3.	**Ans:** **A, D or F** **B, G, F or D** **C, E** **H, K** **I, J, L** •[1] Strategy: attempt to re-arrange existing packages and add new packages •[2] Communication: arrange boxes on shelves	**2**	 •[1] Rearrange old stock onto 3 shelves •[2] Arrange new stock onto remaining 2 shelves

Notes:

- If new and old stock are mixed on the same shelf and all shelves hold ≤ 10m — award 1/2
- Common incorrect answer: — award 1/2

Shelf 1	A J
Shelf 2	B I
Shelf 3	C D L
Shelf 4	E H
Shelf 5	G F K

Question	Expected Answer(s) Give one mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
4.	**Ans: No, supported by working** •[1] Strategy: know to use upper/ lower limits •[2] Process: calculate % within tolerance •[3] Communication: state conclusion	**3**	•[1] Evidence of 2·35 and 2·45 (may be implied in [2]) •[2] 17/20 = 85% •[3] No, as 85% < 88%
	Alternative Strategy 1: •[1] Strategy: know to use upper/ lower limits •[2] Process: calculate % outwith tolerance •[3] Communication: state conclusion		•[1] Evidence of 2·35 and 2·45 (may be implied in [2]) •[2] 3/20 = 15% •[3] No, as 15%>12%
	Alternative Strategy 2: •[1] Strategy: know to use upper/ lower limits •[2] Process: calculate minimum number needed for batch to be accepted •[3] Communication: state conclusion		•[1] Evidence of 2·35 and 2·45 (may be implied in [2]) •[2] 88% of 20 = 17·6, ie need 18 •[3] No, as only 17 in tolerance, so batch fails

Notes:

- Limits need not be stated explicitly if the 3 washers out of tolerance are clearly shown
- If incorrect limits are **stated**, follow through to possibility of 2/3
- If limits are stated as 1·9 and 2·9 (± 0·5) → 100% within tolerance so batch accepted (working significantly eased) award 1/3
- Numerical comparison is not needed for 3rd mark

Question			Expected Answer(s) Give one mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
5.			**Ans: £2(·00)/200p per litre** •[1] Strategy: know to use proportion •[2] Process: price per litre	**2**	 •[1] $\frac{66}{330} \times 1000$ •[2] 200p = £2(·00)
			Alternative Strategy: •[1] Strategy: know to use proportion •[2] Process: price per litre		 •[1] 3 × 330ml +10ml →3 × 66p + ?, where ? < 66p •[2] 198p + 2p = 200p = £2(·00)
Notes: • 3 × 330ml = 1 litre → £1·98 (working significantly eased) award 0/2 • Correct answer with no working award 2/2					
6.			**Ans: £163·75** •[1] Process: calculate selling price of the shares •[2] Process: calculate 2½% of selling price •[3] Process: calculate amount she receives •[4] Process: calculate loss	**4**	 •[1] 200 × £2·75 = £550 •[2] 2½% of £550 = £13·75 •[3] £550 – £13·75 = £536·25 •[4] £700 – £536·25 = £163·75
			Alternative Strategy: **single share basis:** •[1] Process: calculate price per shares •[2] Process: calculate loss •[3] Process: calculate fee •[4] Process: calculate loss		 •[1] £700 ÷ 200 = £3·50 •[2] 200 × £0·75 = £150 •[3] 2·5% of (£700 – £150) = £13·75 •[4] Calculate total loss: £150 + £13·75 = £163·75
Notes: • For: £700 – (£550 + £13·75) = £136·25 award 3/4 • For: £700 – £550 = £150 award 2/4 **Some common answers for Alternative Strategy:** • Candidate calculates 2·5% of £150 = £3·75 → £150 + £3·75 = £153·75 award 3/4 • Candidate calculates the fee per share to be £0·06875 then rounds to £0·07 leading to a loss of £164 (premature rounding penalised) award 3/4					

Question	Expected Answer(s) Give one mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
7.	**Ans: Yes, since 3·5m > 320cm** •[1] Strategy: Know to use correct form of Pythagoras' Theorem •[2] Process: Calculate half of third side of scarf •[3] Process: Calculate perimeter •[4] Communication: Yes with justification	**4**	•[1] $c^2 = 100^2 - 80^2$ or $c^2 + 80^2 = 100^2$ •[2] $\sqrt{3600} = 60$ •[3] $100 + 100 + 2 \times 60 = 320$ •[4] Yes, since 3·5m > 320cm Or she will have 30cm extra

Notes:

- If candidate finds $100^2 + 80^2$ →an answer of 456cm, so not enough ribbon, award 3/4
- Minimum working for 3rd mark: Correct answer to 100 + 100 + (2 × **their** 'length' of half the base)
- For: 3 × 100 = 300cm → enough ribbon as 300cm < 3·5m award 1/4
- For a conclusion of, eg,' enough ribbon as 3·5m > 3·2m, so she has 3m extra', disregard the subsequent incorrect calculation of extra length of ribbon

8.	**Ans: Rule 1: Yes as 640 is upper limit of tolerance** **Ans: Rule 2: No as 17/30>½** •[1] Strategy: know to check both rules •[2] Process: find 2 × riser + tread •[3] Communication: within tolerance, so passes rule 1 •[4] Process: calculate gradient •[5] Communication: shows that gradient > ½ , so fails rule 2	**5**	•[1] evidence •[2] 2 × 170 + 300 = 640 •[3] 625±15; range 610 – 640; 640 is within this range •[4] 170/300 or equivalent •[5] 170/300>½, so fails rule 2

Notes:

- For 3rd mark, limits do not need to be stated explicitly
- For 3rd mark, do not penalise error in calculation of **lower** limit
- G = V/H or equivalent is not sufficient to show that rule 2 has been considered

Special case: When candidate only considers one of the rules.

A: If candidate has correctly found the gradient and correctly used equivalent fractions to compare it with ½.
In this case if the conclusion states:
'Fails rule 2 so **both** rules not met' award 5/5
'Fails rule 2.' (no mention of both rules) award 2/5

B: If candidate only considers 2 × tread + height, but miscalculates so that the answer is outwith tolerance.
In this case if conclusion states:
'Fails rule 1, so **both** rules not met' award 4/5
'Fails rule 1' (no mention of both rules) award 1/5

Question			Expected Answer(s) Give one mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
9.	(a)		**Ans: £360** •[1] Process: correct total	**1**	 •[1] Total = £360
Notes:					
	(b)		**Ans: £165·50** •[1] Strategy: knows how to calculate finance package •[2] Process: calculate deposit •[3] Process: find total finance package •[4] Communicate: state extra cost	**4**	 •[1] Evidence of attempt to find deposit **and** attempt to find total finance package •[2] 10% of (40 + 120 + 180 + 10 + 105) = £45·50 •[3] £45·50 + 12 × £40 = £525·50 •[4] £525·50 – £360 = £165·50
Notes: • If candidate finds 10% of answer to (a), instead of 10% of £455 then a maximum of 3/4 is available Eg 12 × £40 + 10% of £360 = £516 £516 - £360 = £156					
10.	(a)		**Ans: 237·12m^2** •[1] Strategy: find radius of semi-circle •[2] Process: calculate area of semi-circle •[3] Process: calculate remaining area •[4] Process: calculate total area	**4**	 •[1] r = 4 •[2] A = ½ × 3·14 × 4^2 = 25·12 •[3] A = 18 × 12 – 2 × 2 = 212 •[4] A = 212 + 25·12 = 237·12
Notes: •[1] may be implied by •[2] **A common incorrect response:** If radius taken as 3m → A = ½ × 3·14 × 3^2 = 14·13 → 212 + 14·13 = 226·13m^2 award 3/4					
	(b)		**Ans: £4077** •[1] Strategy: find minimum number of packs •[2] Process: calculate cost	**2**	 •[1] 237·12 ÷ 4 = 59·28 Therefore 60 packs required •[2] 60 × £67·95 = £4077
Notes: • If answer to (a) is a multiple of 4, the 1st mark is not available • If answer to (a) is 226·13m^2 ,correct follow through would be 57 × £67·95 = £3873·15					

[END OF MARKING INSTRUCTIONS]