Essential Skills Application of Number Level 2 Sample paper 3

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Sample Paper 3
Mark scheme

Guidance notes for sample paper mark schemes
Level 1 and Level 2

Notes:

The mark scheme has been carefully constructed to avoid penalising candidates repeatedly for similar errors:

1) Principle of follow through applies throughout unless otherwise stated. This allows the candidates to gain credit for subsequent correct calculation based on a previous incorrect answer.

2) Units or numbers shown in brackets on the mark scheme are not required for the awarding of mark/s on the candidate's paper. However, if a candidate states units they must be correct:

eg 24(cm) means accept 24cm or 24 but not 24m
eg (£)72.5(0) means accept £72.50 or £72.5 or 72.50 or 72.5

3) URT means unrounded, rounded or truncated; the underlining defines the acceptable limit of approximation:

eg 860. *8652* URT (U is the unrounded version)
the following are acceptable: 860 (T) or 861 (R) 860.8 (T) or 860.9 (R) or 860.86 (T) or 860.87 (R) or 860.865 (R) or 860.8652 (U) but not eg 900.

Total marks available: 50

AON Level 2: Task 1 – Holiday in Sweden			
Question	**Total marks**	**Marks**	**Marks awarded for**
1A	**2**	**2**	**(£)581.75**
		1	complete correct method with calculation or rounding error **or** x0.65 or equivalent seen **or** (£)313.25 for deposit paid
1B	**4**	**2**	**(£)795.88** **Accept (£)795 OR (£)796**
		1	(£)795.8*801498* URT **or** ÷10.68 seen
		2	**($)1020**
		1	x 0.12 seen
1C	**1** **no mark for repeat calc**	**1**	**a complete correct check of any original calculation seen in 1A or 1B using a different method** **eg a reverse calculation OR a calculation using approximate values**
1D	**4**	**1**	**6 hours WITH units** ***Note: ignore references to ahead or behind or + or –***
		3	**7am WITH units OR 07:00 OR 0700** ***follow through their time difference***
		2	7 WITHOUT units **or** 31:00 seen in working
		1	1am or equivalent ie New York departure time + 9.5 hours accept 25:00 seen in working **or** 21:30 or 9:30pm ie New York departure time + 6 hours
1E	**6** **See example answers in table below**	**1**	**route including all four places to visit**
		4	**all five distances correct in metres**
		3	three distances correct
		2	two correct distances with or without units **or** all five unscaled distances ie squares or centimetres
		1	two unscaled distances ie squares or centimetres **or** 1 square = 100m or 1 centimetre = 100m seen
		1	**correct total distance for their route in kilometres**
1F	**4** **See example answers in table below**	**4**	**all five times correct to nearest minute** ***follow through 1E***
		3	four correct times to the nearest minute **or** all five unrounded times in minutes
		2	one time correct to the nearest minute **or** three unrounded times in minutes **or** all five times in decimal hours
		1	÷5 seen for converting distance to decimal hours **or** 12 minutes or 0.2 hours for 1km seen
1G	**4**	**2**	**concert hall marked 5cm ± ½ small square from the museum in any direction**
		1	concert hall marked 5cm ± 2 small squares from the museum in any direction
		1	**concert hall marked any distance due west of museum**
		1	**concert hall marked and labelled on plan** ***do not penalise spelling***
			Total for task 1 = 25 marks

Example answers for 1E, 1F

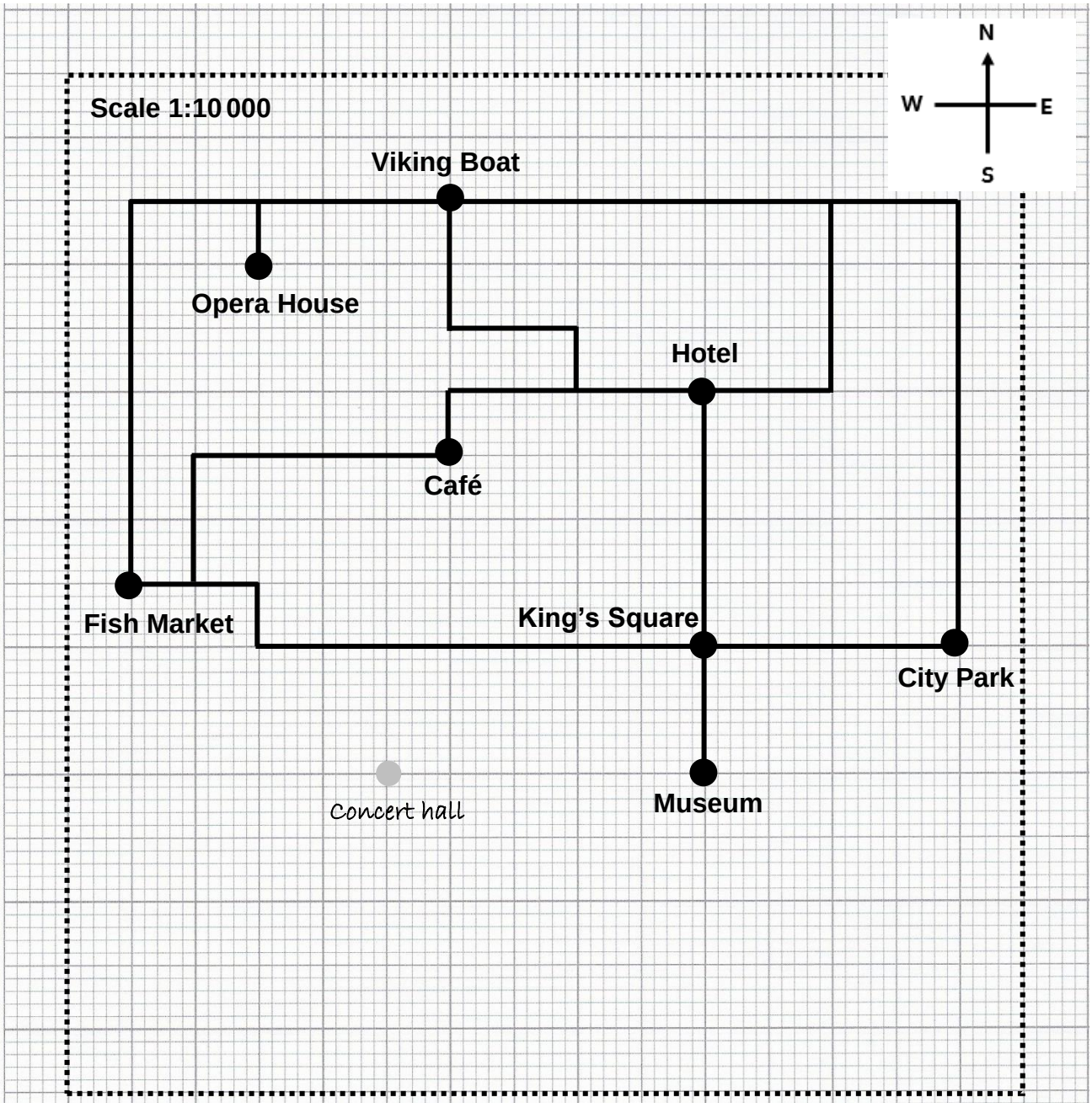
Possible route

From	To	1E distance	1F time in minutes (unrounded time)
Hotel	Viking boat	700m	8 (8.4)
Viking boat	Café	800m	10 (9.6)
Café	Fish market	700m	8 (8.4)
Fish market	City park	1400m	17 (16.8)
City park	Hotel	800m **OR** 1400m	10 (9.6) OR 17 (16.8)

Note: Any route visiting each site once is acceptable.
Depending on the order of the route, the following stages may appear in the route

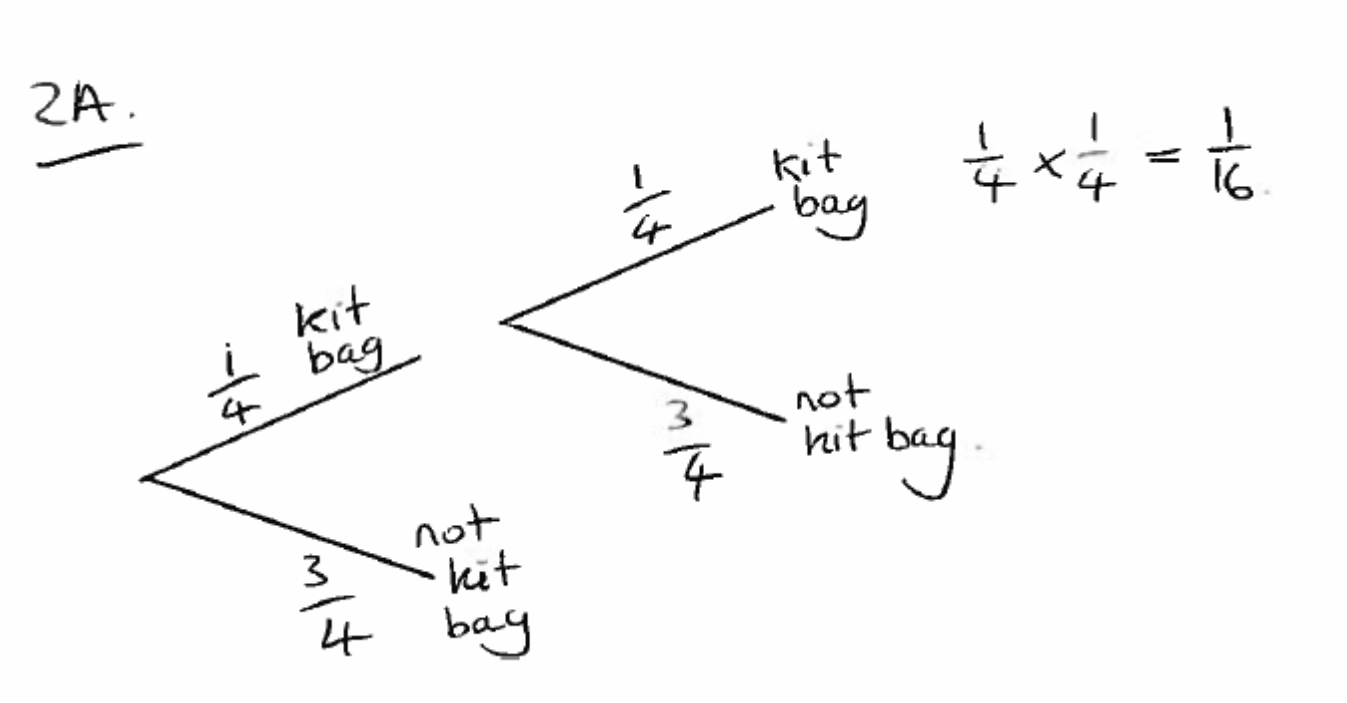
From	To	1E distance	1F time in minutes (unrounded time)
Viking boat	Fish market	1100m	13 (13.2)
City park	Viking boat	1500m	18
Café	Hotel	500m	6

Example plan for 1G

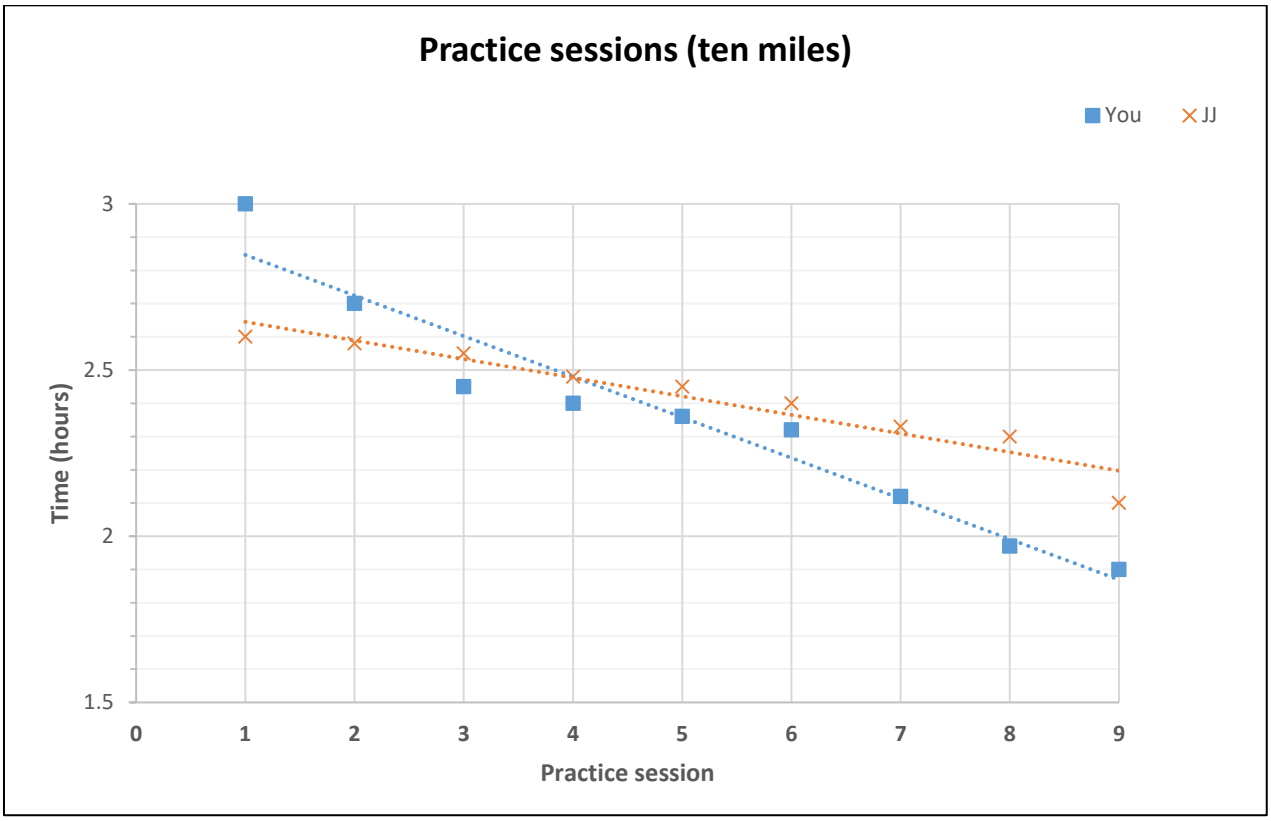


AON Level 2: Task 2 – Half marathon training			
Question	**Total marks**	**Marks**	**Marks awarded for**
2A	**4**	**2**	**probability tree or table drawn showing possible prize combinations for two months,** **eg two sets of 4 outcomes (see examples below)** **eg two sets of 2 outcomes for kit bag/not kit bag (see example below)** ***Note 1/16 not needed for the first two marks***
		1	probability tree or diagram drawn for one month, ie 2 or 4 outcomes
		2	**1/16 or 6.25% or 0.0625**
		1	accept 1 : 16 for 1 mark only **or** correct method ie $\frac{1}{4} \times \frac{1}{4}$ or equivalent seen
2B	**4**	**1**	**trend line (line of best fit) drawn for given data showing negative correlation with approximately equal plots either side of the trend line for JJ (see example below)**
		1	**trend line (line of best fit) drawn for given data showing negative correlation with approximately equal plots either side of the trend line for you**
		2	**two valid comments comparing you and JJ** **eg both runners are getting faster AND I'm improving faster than JJ**
		1	one valid comment comparing you **or** JJ eg both runners are getting faster
2C	**4**	**4**	**Yes for you AND suitable explanation** **eg Yes, 2.2 < 2.5 hours** **eg Yes, 2.2 hours is faster than 2.5 hours** **AND No for JJ AND suitable explanation** **eg No, 2.676 > 2.5 hours** **eg No, 2.676 hours is slower than 2.5 hours**
		3	Yes for you **and** suitable explanation **or** No for JJ **and** suitable explanation
		2	correct substitution into formula for you **or** JJ or two correct values for T ie 1.9 for you **and** 2.1 for JJ
		1	one correct value for T ie 1.9 for you **or** 2.1 for JJ
2D	**4**	**4**	**02:12:06**
		3	02:12:00 **and** 02:12:12 for 8th and 9th values identified
		2	02:12:00 **or** 02:12:12 from 8th or 9th value **or** 02:11:42 or 02:11:48 or 02:13:12 or 02:13:18 from one error in ordering times
		1	evidence of some ordering of times in ascending or descending order
2E	**2**	**2**	**suitable comment with reference to at least one relevant figure** **eg JJ's predicted time is slower because it is more than 2.5 hours** ***follow through 2C and 2D***
		1	suitable comment without reference to figures eg JJ's predicted time is slower
2F	**3**	**2**	**02:02:00**
		1	01:50:48 **and** 03:52:48 seen
		1	**suitable explanation eg The range shows the times varied a lot.**
2G	**4** **no marks for table or pie chart**	**1**	**bar chart with 4 bars OR line graph with 4 plots showing total amounts raised only**
		1	**suitable vertical axis label AND bar labels/ key** ***note: allow references to average score in title as alternative to vertical axis label***
		1	**continuous linear scale on vertical axis sufficient for their values, starting at (implied) zero for bar chart, need not start at zero for line graph**
		1	**all bar heights or plots correct ± ½ small square**
			Total for task 2 = 25 marks

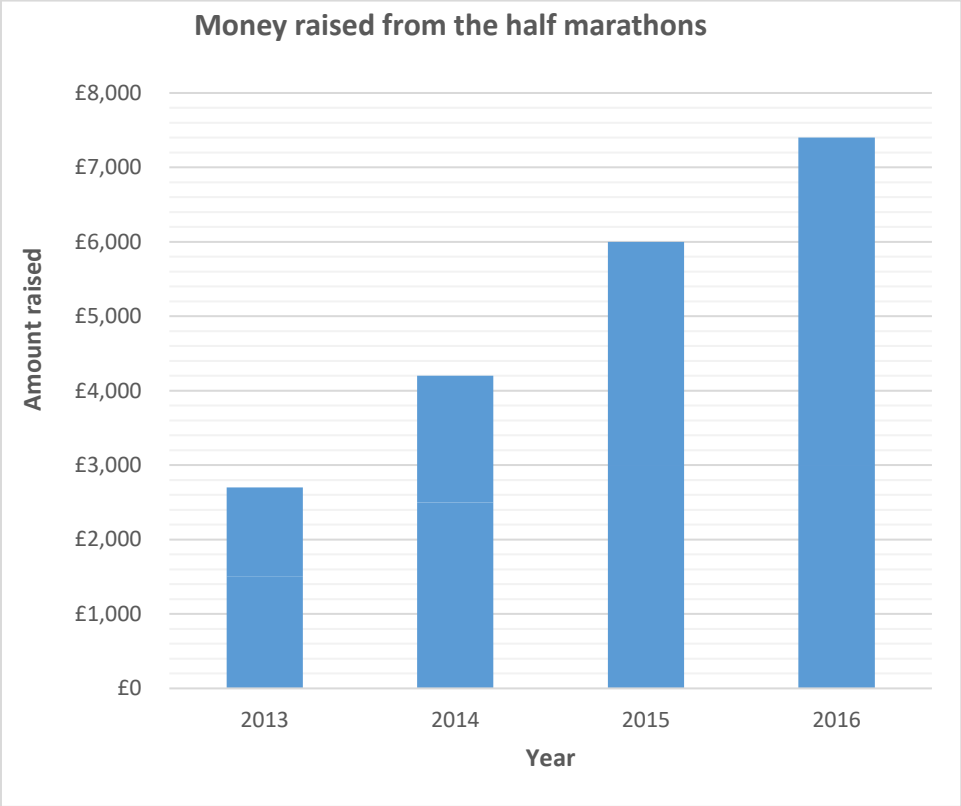
Example probability tree and table for 2A



Example graph for 2B



Example chart for 2G



Content and Range Standard Level 2

Coverage and Range (Technical skills)
a) Understand and use positive and negative numbers of any size in practical contexts
b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places
c) Understand, use and calculate ratio and proportion, including problems involving scale
d) Understand and use equivalences between fractions, decimals and percentages
e) Understand and use simple formulae and equations involving one- or two-step operations
f) Recognise and use 2D representations of 3D objects
g) Find area, perimeter and volume of common shapes
h) Use, convert and calculate using metric and, where appropriate, imperial measures
i) Collect and represent discrete and continuous data, using ICT where appropriate
j) Use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate
k) Use statistical methods to investigate situations
l) Use probability to assess the likelihood of an outcome

The table on the next page shows how each of the Coverage and Range (Technical Skills) standards are assessed within this paper.

Coverage and range (Technical skills)	Task 1							Task 2							Total marks *
	1A	1B	1C	1D	1E	1F	1G	2A	2B	2C	2D	2E	2F	2G	
a) Understand and use positive and negative numbers of any size in practical contexts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–
b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places	✓	✓2	✓1			✓4	✓	✓		✓					7
c) Understand, use and calculate ratio and proportion, including problems involving scale		✓			✓3										3
d) Understand and use equivalences between fractions, decimals and percentages	✓2							✓							2
e) Understand and use simple formulae and equations involving one- or two-step operations										✓2					2
f) Recognise and use 2D representations of 3D objects					✓3		✓2								5
g) Find area, perimeter and volume of common shapes															-
h) Use, convert and calculate using metric and, where appropriate, imperial measures		✓2		✓4	✓		✓2			✓	✓	✓			8
i) Collect and represent discrete and continuous data, using ICT where appropriate								✓2	✓					✓4	6
j) Use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate									✓2	✓2	✓	✓2	✓1	✓	7
k) Use statistical methods to investigate situations									✓2		✓4	✓	✓2		8
l) Use probability to assess the likelihood of an outcome								✓2							2
Total	2	4	1	4	6	4	4	4	4	4	4	2	3	4	50

*The marks in the final column give an indication of the degree of emphasis placed on different content strands. Note, however, that no marks are assigned to the first strand (a – whole & negative). This is because engagement with whole numbers characterises almost every question in the assessment. Negative numbers are not directly assessed in this paper.

Mark distribution per *Skill Standard*

Question	Available marks	Represent	Calculate	Interpret	Open	Fixed
1A	2	1	1	0	2	0
1B	4	2	2	0	4	0
1C	1	1	0	0	1	0
1D	4	1	3	0	4	0
1E	6	3	3	0	6	0
1F	4	2	2	0	4	0
1G	4	1	0	3	4	0
2A	4	1	1	2	4	0
2B	4	0	0	4	2	2
2C	4	2	2	0	2	2
2D	4	2	2	0	0	4
2E	2	0	1	1	2	0
2F	3	1	1	1	1	2
2G	4	0	0	4	4	0
	50	17	18	15	40	10
		34%	36%	30%	80%	20%