OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

OCR FUNCTIONAL SKILLS QUALIFICATION IN MATHEMATICS AT LEVEL 2

9 – 13 JULY 2012

The maximum mark for this paper is [60]

This document consists of 9 printed pages

[Turn over

OCR Level 2 Functional Skills Maths Referencing for Coverage and Range

Our ref	Coverage and Range
N1	understand and use positive and negative numbers of any size in practical contexts
N2	carry out calculations with numbers of any size in practical contexts, to a given number of decimal places
N3	understand, use and calculate ratio and proportion, including problems involving scale
N4	understand and use equivalences between fractions, decimals and percentages
A1	understand and use simple formulae and equations involving one- or two-step operations
G1	recognise and use 2D representations of 3D objects
G2	find area, perimeter and volume of common shapes
G3	use, convert and calculate using metric and, where appropriate, imperial measures
S1	collect and represent discrete and continuous data, using information and communication technology (ICT) where appropriate
S2	use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using information and communication technology (ICT) where appropriate
S3	use statistical methods to investigate situations
S4	use probability to assess the likelihood of an outcome

N – Number
A – Algebra
G – Geometry
S - Statistics

Representing	**Our Ref**
Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.	R1
Identify the situation or problems and identify the mathematical methods needed to solve them.	R2
Choose from a range of mathematics to find solutions.	R3
Analysing	
Apply a range of mathematics to find solutions.	A1
Use appropriate checking procedures and evaluate their effectiveness at each stage.	A2
Interpreting	
Interpret and communicate solutions to multistage practical problems in familiar and unfamiliar contexts and situations.	I1
Draw conclusions and provide mathematical justifications	I2

FS Maths L2 July 2012 Marking Guidance

Task 1 – Bears

Process	Award	on evidence of …
Part (a)		
Calculating total cost **[A]**	**2**	**2**: £38.98 + £2.95 = £41.93 (correct total cost) _____ **or** _____ **1**: £14.99 + £23.99 = (£)38.98 (subtotal for bears) seen **or** (£)2.95 (postal cost) seen as candidates'' own sub-working £s not necessary **or** (£)44.88 (from 14.99+2.95+23.99+2.95)
Part (b)		
(i) Identifying earliest date **[B]**	**1**	**1:** (Saturday) 24th July
(ii) Finding postal and total cost **[C]**	**2**	**2:** £23.99 + £5.95 = £29.94 (correct cost) _____ **or** _____ **1**: (£)5.95 or (£)23.99 seen.
Part (c)		
(i) Identifying the size of box required **[D]**	**2**	**2:** 254 × 203 × 152 (mm) _____ **or** _____ **1:** 254 or 203 or 152 seen (may be implied by price e.g. (£)22.09 ⇒ 152 × 152 × 152) *The size of box chosen by candidates follows through into part (ii)*
(ii) Calculating cost per box **[E]**	**3**	**3:** £0.2625 or 26.25p or 26p or 27p www (i.e. correct money units needed) **or** **2:** figs 2625 or 26 or 27 seen www _____ **or** _____ **1:** 1000÷"40" = "25" (the number of packs) seen, ⇒ from price band chosen for pack – if clear. **1:** "10.50*"÷"40" or equivalent unit cost calculation method (condone lack of correct money units) i.e. price per pack* ÷ boxes per pack * a number in the candidates' correct row. **1:** £"0.2625" or "26.25p" or "26p" or "27p" (i.e. correct money units needed)

Process	Award	on evidence of …
Part (d)		
Cost comparison		Medium bear is 25.1 × 15 × 12.4 (cm), processes [F] and [G] may be carried out in reverse order.
Finding size of sack **[F]**	**2**	**1:** 25.1 × 1.25 = 31.375 or equivalent required length **1:** 15 × 2 = 30 or equivalent required width _____ **or if zero scored** _____ **1:** 15 or 12.4 × 1.25 = (18.75 or 15.5) (condoning length/width/height confusion) **or** a number clearly increased by 25%
Converting metric to imperial dimensions **[G]**	**2**	*Full follow through on candidates' choice of sack size.* **1:** "30"÷2.54 (or × 0.39) = 11.8/11.7 (required length in inches, units not needed) **1:** "31.375"÷2.54 (or × 0.39) = 12.35... / 12.23 ... (required width in inches, units not needed)
Choosing appropriate sack size **[H]**	**1**	**1:** 12 x 14 (allow full follow through on candidates' Imperial sack dimensions) (Statement of 12 x 14 without evidence of processes [F] and [G] cannot gain credit for these.)
Comparing cost of sacks and boxes **[I]**	**2**	**1:** "(£)62.50 or 66.70" seen (for candidates' sack size – not asked for cheapest so 100 x 10 or 1000) **1:** Comparison with candidates' cost for boxes from [E] (comparing like with like)
Making a decision as to the cheapest: sacks or boxes **[J]**	**1**	Correct decision based on their comparison and answer to the original question – "Are sacks cheaper?" (Must be by comparing like with like – beware false comparisons.)
Checking **[K]**	**2**	**2:** Clear evidence of a formal checking procedure being carried out at least once (e.g. by reverse calculation or repeating the calculation providing this is clearly a genuine check as opposed to a mere copying exercise). **1:** Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or inappropriate/not expected _____ **or** _____ Two or more calculations relevant to the task correctly performed, together with the absence of idiosyncratic part answers in the course of the task – these will usually be such that they are clearly at least two orders of magnitude different from the real-life quantity or measure. *Possible examples for this task might be prices/costs in £1000s of pounds, or Imperial dimensions of several hundred inches.* **0:** No evidence of checking or consideration of reasonableness of answers – including bland statements to the effect that calculations were checked without any relevant evidence.

Task 2 – Flying Bags

Process	Max.	Award ... on evidence of …	R	A	I
Part (a)					
(i) Calculating excess baggage charge **[A]**	**2**	**2:** (£)50 _____ **or** _____ **1:** "number" ÷ 100 or equivalent _____ **or** _____ **1:** (£)5 seen (i.e. 1%)	R2	A1	
(ii) Calculating 1/20 of £500 **[B]**	**1**	**1:** £25			I1
Part (b)					
(i) Estimating a comfortable bag weight to lift into locker **[C]**	**1**	**1:** (5 to 35) kg (must have the unit)	R1		
(ii) Changing Imperial bag dimensions into metric **[D]**	**2**	**2:** 55- 56 38-39 22-23 seen 1 for each maximum of 2	R2	A1	
Finding airlines with allowance greater than above **[E]**	**2**	**1:** Monarch **1:** British Airways Follow through on "dimensions" including linear length If only 1 or 2 are listed which are correct award 1 or 2. e.g. 1 correct + 1 wrong = 1, but more than 1 wrong gets zero 2 correct + 1 wrong = 1, more than 1 wrong = zero	R2	A1	
Part (c)					
Calculating volume of Anita's bag. **[F]**	**2**	**1:** 26 x 38 x 15 seen or implied **1:** 14820 (cm^3)	R2		I1
Comparing calculated volume with stated volume in litres. **[G]**	**2**	**1:** Comparing litres with cm^3 15000 with "14820" or Comparing cm^3 with litres 15 with "14.82" **1:** Sensible reason fitting "comparison" such as bag not a true cuboid, pockets, rounding etc.			I1 I2

Process	Max.	Award ... on evidence of …	R	A	I
Part (d)					
Comparing size (volume) of bags allowed by American Airlines with Flybe **[H]**	**6**	Two possible routes (X) by volume and adjusting/investigating the dimensions of American Airlines using their given linear length, or, (Y) comparing the latter's linear length with the calculated Flybe linear length. The latter approach has limited credit. (Allow full credit for the clear argument along lines that Volume of (a + x) by (b + y) by (c + z) is greater than a by b by c.)	R2	A1 A1	I1 I2 I2
X					
Finding maximum volume of American Airlines allowed bag	**4**	**1:** Three numbers seen for dimensions of case that sum to x (where $108 \leq x \leq 114$) **1:** Attempt to calculate a volume using these three figures **2:** Correctly calculated volume ≥ 40250 or 1: correctly calculated volume less than this			
Finding volume of Flybe allowed bag	**1**	**1:** 50 x 35 x 23 or figs 40250			
Comparing the two volumes	**1**	**1:** Comparison made with reference to original question and based on candidates' figures.			
Or	**or**	**or**			
Y					
Finding the linear length of a allowed bag on Flybe	**2**	**1:** 50 + 35 + 23 (see note above) **1:** = 108(above make can be implied)			
Comparing the linear lengths of the two permitted bag sizes	**1**	**1:** Comparison made with reference to original question and based on candidates' figures.			
Evidence of checking **[I]**	**2**	**2:** Clear evidence of a checking procedure being applied **1:** Any recognition that answers are appropriate/expected or inappropriate/not expected or no obvious errors (3 or more correct calculation or part calculations) **0:** Obvious incorrect answers or no evidence of checking or considering appropriateness of answer		A2 A2	
		SR=4	**6R**	**7A**	**7I**

Task 3 – Cars and Choices

Process	Max.	Award ... on evidence of …	Notes
Part (a)			
Calculating the cost of diesel **[A]**	**2**	**2:** £24.18 or 2418p seen **1:** 120.9 × 20 **or** figs 2418 **or** £22.18 seen	
Part (b)		*Allow full follow through for annual mileage throughout the rest of the task.*	
Calculating annual mileage in 2009. **[B]**	**2**	**2:** 12926 **1:** sight of 38446 - number **or** number - 25520 or 12816	
Part (c)			
i Using given formula to calculate annual diesel consumption. **[C]**	**2**	**2:** (1020 to 1030) www – follow through on mileage ("12926" × 0.0796 …) or equivalent **1:** Two or more of [these] seen or implied being used in formula: $\frac{["12926"]\times[4.5]}{[56.5]}$ (**2:** all 3 correct)	**A1, G3**
ii Calculating the annual cost of diesel. **[D]**	**1**	**1:** 'diesel used' x 120.9 (between £1200 and £1300)	
iii Total Cost **[E]**	**2**	**2:** 'diesel cost' + (110 + 190 + 90) / (390) (£1634.67/£1624.40) (the + 390 might be implied) **1:** One of the costs missing **or** 210 + 110 (hybrid) seen	

Process	Max.	Award ... on evidence of …	Notes
Part (d)			
Calculating the hybrid cost. **[F]**	**5**	**5:** £1188.20 or £1180.60 www _____ **or** _____ **1:** sight of petrol used (776.2 to 783) allow follow through iff clear. **1:** sight of cost of petrol (£)868.20 or (£)860.60 or "782" x figs. 1109 **1:** sight of tyres cost (£)110 **1:** sight of servicing cost (£)210 Above 2: $\Rightarrow$ (£)320 **1:** 'petrol cost' + 'tyre cost' + 'servicing cost' iff origin clear. Condone inclusion of purchase price. _____ all ____ If incorrect money notation -1 on their final answer.	**S2**
Part(e)			
Recommending between diesel and hybrid based on data given and calculated. **[G]**	**4**	**4:** Statement based on above calculations x4 and difference in price of cars _____ **or** _____ **2:** Statement based on above calculations and difference in price of cars (no "× 4") _____ **or** _____ **1:** Statement based on above calculations _____ **or** _____ **1:** Statement based on difference in price of cars (£2531). _____ **or** _____ **2:** Sight of calculations over 4 years but no statement (price of cars not necessary) but +1 if statement given _____ **or** _____ **3:** ½ each for qualitative statements such as below or equivalent (round up maximum of (3) e.g. Hybrid is less tax better acceleration less CO_2 better fuel consumption cheaper fuel Diesel is cheaper service cheaper price	**I1,I2**

Process	Max.	Award ... on evidence of …	Notes
Checking calculations or considering feasibility/viability of answers. **[H]**		**2:** Clear evidence of a checking procedure being carried out at any appropriate point in the task. **1:** Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or inappropriate/not expected **or** no idiosyncratic part answers in the course of the task. **0:** No evidence of checking or consideration of reasonableness of answers – including bland statements to the effect that calculations were checked without any relevant evidence	**A2**