LEVEL 2 FUNCTIONAL SKILLS QUALIFICATION IN MATHEMATICS

PRACTICE ASSESSMENT 3 (FSM201P)

MARK SCHEME

Section A	Process (Task description)	Total mark	Mark allocation	Comments	PS or US	Subject content
Question 1	Correct subtraction of fractions	1	**1 mark:** Correct subtraction of the two fractions, i.e. 13/12 or 1 1/12	Award for decimal answer 1.083… or 1.08	US	7c
Question 2	Correct order	1	**1 mark:** 0.004709 0.004879 0.04789 0.04798 0.479	Accept largest to smallest	US	9a
Question 3	Add decimals up to 3 decimal places	1	**1 mark:** (35.986 + 0.28) = 36.266		US	10a
Question 4	Correct mode calculated	1	**1 mark:** 10.2	Do not award for median, mean or range	US	23b
Question 5	Method to find missing angle	2	**1 mark:** Valid method to calculate missing angle, e.g. 180 – 90 = 90, 90 - 47= (43) OR 180 – 90 – 47= (43) OR 47 + 90 = 137 AND 180 – 137 OR Other valid method	Award if 43 seen	US	22
	Correct angle		**1 mark:** correct angle shown i.e. 43(°)	Units not required	US	22
Question 6	Understanding of ratio shown	3	**1 mark:** Evidence of understanding of correct use of ratio, e.g. 1 in 8 OR 1/8th OR 8 parts seen OR 63000 ÷ 8 OR other valid calculations of ratio.	.	PS	11a
	Method to calculate number of oak trees		**1 mark:** Correct method to find number of oak trees required, e.g. 63000 ÷ 8 x 3 = (23625) OR 63000 - 36000 = (39375) OR 7875 x 3 = (23625) OR Other valid method		PS	11a
	Correct number of oak trees found		**1 mark:** Correct number of oak trees found, i.e. (23625 - 3623) = 20002		PS	11a
Question 7	Method to calculate direct proportion	2	**1 mark:** Valid method to calculate how many trees 5 people can plant, e.g.	Award if 56 seen	PS	11b

			45 ÷ 4 x 5 = (56.25) OR Build up method OR Other valid method			
	Correct number of trees found		**1 mark:** Correct number of trees found, i.e. 56		PS	11b
Question 8	Calculate the median of a set of quantities Calculate the range of 2 sets of data Compare the ranges of 2 sets of data	4	**1 mark:** Correct median for 2018, i.e. 1278		PS	25
			1 mark: Correct comparison of median with 2017, i.e. No, Elsa is not correct, the median is higher in 2018 than in 2017		PS	25
			1 mark: Correct range found for 2017 AND 2018, i.e. (1692-987) = 705 **AND** (1654-1032) = 622		PS	25
			1 mark: Correct comparison of range with 2017, i.e. Yes, Elsa is correct, the range is lower in 2018 than in 2017, showing that the number of visitors is more consistent in 2018.		PS	25

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Section B	Process (Task description)	Total mark	Mark allocation	Comments	PS or US	Subject content
Question 9	Use a formula to find the surface area of a sphere	3	**1 mark:** Correct substitution into formula, e.g. SA = 4 × 3.14 × 7.4² OR SA = 4 × 3.14 × 7.4 × 7.4	Allow if used SA = πd² Allow if used higher value for pi, e.g. 3.142	US	17b
	Correct surface area calculated		**1 mark:** correct answer, ie SA= 687.7856 (cm²)	Allow values between: 687.7856 - 688.22368	US	17b
	Decimals rounded correctly		**1 mark:** correct surface area to 3 dp, eg 687.786 (cm²) OR 688.224 (cm²) OR Other valid answer to 3dp	Allow FT for their final answer for SA as long as rounded correctly to 3dp.	US	9b
Question 10	Correct rate of pay calculated	5	**1 mark:** Correct rate of pay as a lifeguard calculated, i.e. (8.16 × 1.45) = (£)11.832	Accept 11.83	PS	15c
	Method to calculate current total pay at different rates		**1 mark:** Method to calculate total current pay for either reception or lifeguard rates of pay, e.g. **Calculates weekly pay on reception:** ((6 × 3) + (1 × 9)) × 8.16 = (£220.32) **OR** (6 + 6 + 6 + 9) × 8.16 = (£220.32) **OR** 27 × 8.16 = (£220.32) **OR** 48.96 × 3 = (£146.88) **AND** 9 × 8.16 = (£73.44**)** **Calculates weekly pay as a lifeguard:** (6.5 + 5.5) × 11.83 = (£141.96) **OR** 12 × 11.83 = (£141.96) **OR** Other valid method	May be implied if (£220.32) or (£141.96) seen Allow FT for their rate of pay for lifeguard	PS	15c

	Calculate total pay		**1 mark:** Correct total current weekly pay, i.e. (£)362.28	Do not allow FT	PS	15c
	Method to calculate number of hours		**1 mark:** Valid method to calculate how many hours needed to match current weekly pay, i.e. 362.28 ÷ 11.83 ≈ (31)	Allow FT	PS	10d
	Approximation of number of hours found based on calculations		**1 mark:** Correct approximation of hours Tom would need to work as a lifeguard to match current weekly pay, i.e. 31 hours	Accept between 30, 30.5 or 31 hours Do not allow FT	PS	10d
Question 11	Method to calculate percentage increase	2	**1 mark:** Valid method to calculate percentage increase, e.g. ((8.82 - 8.16) ÷ 8.16) × 100 = (8.088%) OR 0.66 ÷ 8.16 x100 = (8.088%) OR Other valid method	May be implied if 8%, 8.08%, 8.1% seen	PS	6
	Correct percentage calculated		**1 mark:** 8.09%	Allow 8%, 8.08%, 8.1%	PS	6
Question 12	Method to calculate pool volume	5	**1 mark:** correct method to find volume of a cylinder, i.e. π × 1.125 × 1.125 × 0.62 = (2.46391875m³)	Allow truncated values for π	PS	17a
	Correct volume of water calculated		**1 mark:** correct volume of water, i.e. 2.46391875(m³)	Allow values from 2.46 to 2.47	PS	17a
	Correct median temperature found		**1 mark:** correct median temperature per day found, i.e. 37.72		PS	23a
	Correct substitution into given formula		**1 mark:** Correct substitution of values into formula, i.e. 2.46391875 × 37.72 ÷ 0.85 = (109.16Kwh – 109.61Kwh)	Allow FT for their calculations for median and volume of water	PS	3
	Correct decision		**1 mark:** No	Must have valid calculations to validate decision.	PS	3
Question 13	Order fractions, smallest to largest	1	**1 mark:** $\dfrac{1}{4}$ $\dfrac{3}{5}$ $\dfrac{5}{8}$ $\dfrac{5}{4}$ $\dfrac{3}{2}$	Accept largest to smallest Accept: $1\frac{1}{4}$ and $1\frac{1}{2}$	US	7a

Question 14	Method to calculate OR rule of probability	2	**1 mark:** Valid method to calculate the probability of a blue or a red ball, e.g. $\frac{67}{134} + \frac{47}{134} = \frac{114}{134} = (\frac{57}{67})$ OR 0.5 + 0.3507 = (0.8507) OR 50% + 35.07% = (85.07%) OR Other valid method	Implied if 0.85 seen	US	27b
	Correct decimal calculated		**1 mark:** 0.85	Do not award for fraction or percentage answers	US	27b
Question 15	Method to calculate area of triangular patio	6	**1 mark**: Valid method to find area of patio, e.g. 7.2 × 6.7 = (48.24m^2) AND 48.24 ÷ 2 = (24.12m^2) OR 0.5 × 7.2 × 6.7 = (24.12m^2) OR Other valid method	Award if 24.12 seen Award any correct alternative method	PS	16b
	Correct area calculated		**1 mark**: 24.12(m^2)	Award any correct alternative method	PS	16b
	Starts to calculate how many decking boards or paving stones will fit in the patio area		**1 mark:** Attempts to calculate how many decking boards OR patio stones are required, e.g. Decking wood area 0.12 × 2.4= 0.288(m^2) OR Paving stone area 0.5 × 0.5 = 0.25(m^2) OR How many decking boards fit along length/width of patio? 7.2 ÷ 0.12 = (60) AND 6.7 ÷ 2.4 = (2.79) OR 6.7 ÷ 0.12 = (55.8) AND 7.2 ÷ 2.4 = (3) OR How many paving stones fit along length/width patio? 7.2 ÷ 0.5 = (14.4) AND 6.7 ÷ 0.5 = (13.4) OR Other valid method	Award if 83.7, 83.75 or 84 seen Award if 96, 96.48 or 97 seen	PS	16b

	Method to calculate how many decking boards fit in area		**1 mark:** Correct method to calculate number of pieces of decking required, e.g. 24.12 ÷ 0.288 = (83.75) OR (60 × 2.79) ÷ 2 = (83.7) OR (55.8 × 3) ÷ 2 = (83.7) OR Other valid method	Allow FT for their area, their number of decking boards along the length and width of patio OR their area of decking board if using the area ÷ area method Award if 83.75 seen or 84 seen	PS	16b
	Method to calculate how many paving stones fit in area		**1 mark:** Correct method to calculate number of paving stones required, e.g. 24.12 ÷ 0.25 = (96.48) OR (14.4 × 13.4) ÷ 2 = (96.48) OR Other valid method	Allow FT for their area, their number of patio stones along the length and width of patio OR their area of patio stones if using the area ÷ area method	PS	16b
	Correct choice of cheapest option chosen		**1 mark:** cheaper to buy patio stones option indicated Must have calculations to back up answer, e.g. (5.25 × 84) = £441 **AND** (9 × £40) + (7 × 4.5) = £391.50 OR (10 × 40) = £400	Do not allow FT Must have calculations to back up choice Do not award for decimal values for number of patio stones/decking boards	PS	16b
Question 16	Correct substitution into formula for circumference of a circle	3	**1 mark:** correct method to calculate circumference of the pond, e.g. 3.14 × 3 = (9.42m) OR 2 × 3.14 × 1.5 = (9.42)	Allow 3.142 for π	PS	16a

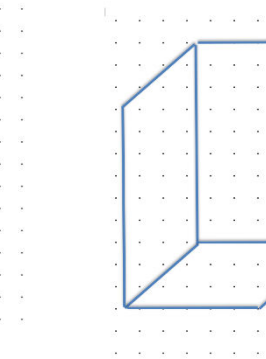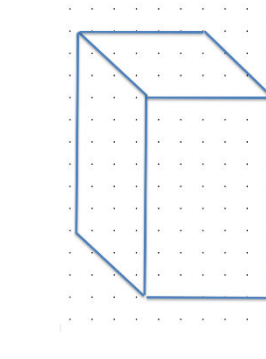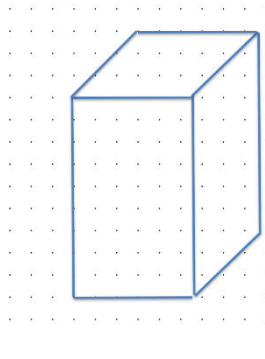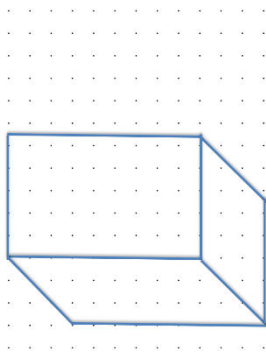|						
	Method to calculate number of bricks required to fit around pond		**1 mark**: valid method to find number of bricks, e.g. 9.42 ÷ 0.21 = (44.86, 45 bricks) OR 9.42 ÷ 0.10 = (94.2, 94 bricks)	Allow use of bricks either width or lengthways Allow follow through for their circumference Award if 94 or 45 bricks seen	PS	16a
	Correct number of bricks calculated		**1 mark**: Correct number of bricks for wall found for either bricks placed lengthways or widthways, i.e. (45 × 6) = 270 OR (94 × 6) = 564	Do not award if decimal number of bricks given	PS	16a
Question 17	Method to convert litres to gallons	3	**1 mark**: Correct method to convert litres to gallons, e.g. 2750 ÷ 4.55 (= 604.3956)		PS	14c
	Method to find no. of bottles of treatment		**1 mark**: Correct number of bottles, eg (604.3956 ÷ 250) = 2.418		PS	14c
	Correct number of bottles calculated		**1 mark**: Correctly rounded number of bottles, ie 3	Allow FT for their incorrect answer	PS	14c
Question 18	Understand how to represent a 3D object in 2D	2	**1 mark:** Any two dimensions drawn correctly from: eg 9 x 5 x 3 OR 9 x 6 x 3 OR 9 x 5.5 x 3	Do not award if a 2D shape drawn or part thereof	US	21
			1 mark: Fully correct representation of the cuboid, ie 9 x 5 x 3 OR 9 x 6 x 3 OR 9 x 5.5 x 3	See possible answers at end of markscheme	US	21
Question 19	Correct evaluation following order of operators	1	**1 mark:** 0.5		US	12
Question 20	Calculate frequency from given values	6	**1 mark:** Correctly complete the frequency column in the table, i.e. 3, 5, 9, 6, 2		PS	24

		Calculate midpoint from given classes of data		**1 mark:** Correctly complete the midpoint column in the table, i.e. 2, 7, 12, 17, 22		PS	24
		Use correct method to calculate estimated total of grouped discrete data		**1 mark:** Method to find estimated total number of races entered, i.e. (3 × 2) + (5 × 7) + (9 ×12) + (6 × 17) + (2 × 22) = (295)	Allow FT using their answers to mark point 1 and 2 Award if 295 seen	PS	24
		Correct total		**1 mark:** Correct total estimated number of races entered, i.e. 295	Do not award for 286 as this is sum of original values	PS	24
		Use correct method for calculating the estimated mean number of races entered		**1 mark:** Correct method for calculating the estimated mean number of races entered, e.g. 295 ÷ 25 = (11.8)	Allow FT for their total frequency and their total estimated number of races	PS	24
		Correct mean calculated		**1 mark:** Correct estimated mean number of races, i.e. 12	Allow 11.8 Must have calculations to back up answer Do not allow 11.44 as this is mean from using original data for calculations	PS	24

Question 21	Correct method to convert km to Miles OR Miles to km	3	**1 mark:** Valid method to convert km into miles or miles into km, e.g. 5 ÷ 8 = (0.625) OR 8 ÷ 5 = (1.6) OR × 0.625 seen OR ÷ 1.6 seen OR Other valid method	Award if 1.6 OR 0.625 seen	PS	14a
	Correctly converts km into miles		**1 mark:** one or more distances correctly converted from km to miles, e.g. (5 ÷ 8 × 5) = 3.125 (miles) OR (10 ÷ 8 × 5) = 6.25 (miles) OR (35 ÷ 8 x 5) = 21.875 (miles) OR (35 ÷ 1.6) = 21.875 (miles) OR (35 × 0.625) = 21.875 (miles)	Allow rounding to nearest whole number value	PS	14a
	Correct number of miles		**1 mark:** Correct number of miles calculated, i.e. (21.875 + 10 + 13.1 + 13.1 + 3 + 26.2) = 87.275 (miles)	Allow 87, 87.28, 87.3	PS	14a
Question 22	Correctly identifies method to calculate pace	3	**1 mark:** method to calculate average pace, i.e. 26.2 ÷ 5.5 = (4.76mph) Alternative method converting hours to minutes = 330mins	Award if 4.76 seen	PS	15a
	Method to find Time Taken		**1 mark:** Method to convert mph into minutes per mile 60 ÷ 4.76 = (12.6) OR 5.5 x 60 ÷ 26.2 = (12.595) Alternative method 330 ÷ 26.2 = (12.60)	Award if 12.6 seen Allow FT for their average speed.	PS	15a
	Correct time calculated		**1 mark** – Correct average running speed in minutes per mile calculated, i.e. 12.6	Award for 12.59	PS	15a

Annotation notes:

Annotation	Meaning
US	Underpinning skills
PS	Problem solving skills
FT	Follow through
(…)	Information that is not required for the mark point

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Q18 possible answers

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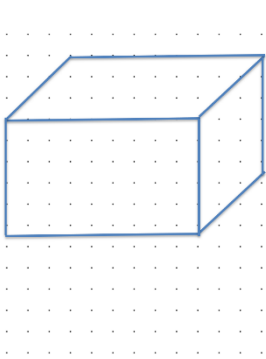
Paper number	FSM201P									
	Section A		Section B						Total	%
	15		15		15		15			
Problem Solving (PS) maximum marks Underpinning skills (US) maximum marks	9 6		12 3		12 3		12 3		Total no of sub-elements mapped = 26	
Tick the boxes to confirm that there is a 5-8 mark question reflecting a multi-step calculation.			✓		✓		✓			
Level 2 Subject Content	PS	US	PS	US	PS	US	PS	US		
1a. Write positive and negative numbers of any size										
1b. Order and compare positive and negative numbers of any size										
2. Carry out calculations with numbers up to one million including strategies to check answers including estimation and approximation										
3. Evaluate expressions and make substitutions in given formulae in words and symbols			2 (Q12)						2	
4. Identify the equivalence between fractions, decimals and percentages										
5a. Work out percentages of amounts										
5b. Express one amount as a percentage of another										
6. Calculate percentage change (any size increase and decrease), and original value after percentage change			2 (Q11)						2	
7a. Order and compare amounts or quantities using proper and improper fractions and mixed numbers						1 (Q13)			1	
7b. Add amounts or quantities using proper and improper fractions and mixed numbers										
7c. Subtract amounts or quantities using proper and improper fractions and mixed numbers		1 (Q1)							1	
8. Express one number as a fraction of another										
9a. Order and compare decimals		1 (Q2)							1	
9b. Approximate decimals				1 (Q9)					1	
10a. Add decimals up to three decimal places		1 (Q3)							1	
10b. Subtract decimals up to three decimal places										
10c. Multiply decimals up to three decimal places										
10d. Divide decimals up to three decimal places			2 (Q10)						2	
11a. Calculate using ratios	3 (Q6)								3	

Skill									Total	%
11b. Calculate using direct proportion	2 (Q7)								2	
11c. Calculate using inverse proportion										
12. Follow the order of precedence of operators, including indices								1 (Q19)	1	
Total: Number and number system									**17**	**28.3**
13a. Calculate compound interest										
13b. Calculate percentage increases, decreases and discounts including tax and simple budgeting										
14a. Convert between metric and imperial units of length, using i) a conversion factor ii) a conversion graph						3 (Q21)			3	
14b. Convert between metric and imperial units of weight using i) a conversion factor ii) a conversion graph										
14c. Convert between metric and imperial units of capacity using i) a conversion factor ii) a conversion graph				3 (Q17)					3	
15a. Calculate using compound measures including speed						3 (Q22)			3	
15b. Calculate using compound measures including density										
15c. Calculate using compound measures including rates of pay		3 (Q10)							3	
16a. Calculate perimeters including triangles and circles and composite shapes including non-rectangular shapes (formulae given except for triangles and circles)				3 (Q16)					3	
16b. Calculate areas of 2-D shapes including triangles and circles and composite shapes including non-rectangular shapes (formulae given except for triangles and circles)				6 (Q15)					6	
17a. Use formulae to find volumes of 3-D shapes including cylinders (formulae to be given for 3-D shapes other than cylinders)		2 (Q12)							2	
17b. Use formulae to find surface areas of 3-D shapes including cylinders (formulae to be given for 3-D shapes other than cylinders)			2 (Q9)						2	
18a. Calculate actual dimensions from scale drawings										
18b. Create a scale diagram given actual measurements										
19. Use coordinates in 2-D, positive and negative, to specify the positions of points										
20. Understand and use common 2-D representations of 3-D objects										

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	PS/US								Total Mark	Total %
21. Draw 3-D shapes to include plans and elevations								2 (Q18)	2	
22. Calculate values of angles and/or coordinates with 2-D and 3-D shapes		2 (Q5)							2	
Total: Measure, shape and space									**29**	**48.3**
23a. Calculate the median of a set of quantities			1 (Q12)						1	
23b. Calculate the mode of a set of quantities		1 (Q4)							1	
24. Estimate the mean of a grouped frequency distribution from discrete data							6 (Q20)		6	
25. Use the mean, median, mode and range to compare two sets of data	4 (Q8)								4	
26. Work out the probability of combined events, including using diagrams and two-way tables										
27a. Express probabilities as fractions										
27b. Express probabilities as decimals						2 (Q14)			2	
27c. Express probabilities as percentages										
28a. Draw scatter diagrams										
28b. Interpret scatter diagrams										
28c. Recognise positive and negative correlation										
Total: Handling data									**14**	**23.3**
Total Mark PS/US Total %	9	6	12	3	12	3	12	3	60	100

Problem solving and decision making requirements: Indicate the question numbers where this is required	Task 1		Task 2		Task 3		Task 4	
Read, understand, and use mathematical information and mathematical terms	Q6, 7, 8		Q10, Q11, 12		Q15, 16, 17		Q20, 21, 22	
Address individual problems based on a combination of the knowledge and/or skills from the mathematical content areas (number and the number system; measures, shape and space; information and data). Some problems draw upon a combination of all three mathematical areas and require learners to make connections between those content areas.			Q10, 12					
Use mathematical information and terms in a problem	Q6, 7, 8		Q10, Q11, 12		Q15, 16, 17		Q20, 21, 22	
Use knowledge and understanding to a required level of accuracy	Q6, 7, 8		Q10, Q11, 12		Q15, 16, 17		Q20, 21, 22	
Identify suitable operations and calculations to generate results	Q6, 7, 8		Q10, Q11, 12		Q15, 16, 17		Q20, 21, 22	
Analyse and interpret answers in the context of the original problem	Q8		Q10		Q15		Q20	
Check the sense and reasonableness of answers	Q6, 7, 8		Q10, Q11		Q15, 16, 17		Q20, Q22	
Present and explain results clearly and accurately demonstrating reasoning to support the process and show consistency with the evidence presented.			Q12		Q16		Q20	