PERCENTAGES

Pearson Edexcel - Monday 8 June 2020 - Paper 3 (Calculator) Foundation Tier

1.

19	(a)	140	M1	for complete method eg $56 \div 40 \times 100$	May be seen in different ways, eg 2.5×56
			A1	cao	
	(b)	32	M1	for method to find percentage, eg $\dfrac{18}{56} \times 100$ (=32.14...)	
			A1	for an answer in the range 32 to 32.2	

Pearson Edexcel - Tuesday 6 November 2018 - Paper 1 (Non-Calculator) Foundation Tier

2.

22	No (supported)	P1	for start to process, eg $2100 \times \frac{40}{100}$ (= 840) **or** $100 - 40$ (= 60)	May compare bonus shares of a single salesman or total bonus share for all 7 salesmen.
		P1	for process to find the 7 salesmen's share of bonus, eg $2100 - "840"$ (= 1260) **or** $2100 \times \frac{"60"}{100}$ (= 1260)	
		P1	for process to find bonus amount each salesman gets eg $"1260" \div 7$ (= 180) **OR** process to find the total bonus for all salesmen if shared equally, eg $\frac{2100}{10} \times 7$ (= 1470)	
		P1	for process to compare what a single salesman gets under each scheme, eg $"180" \times \frac{25}{100}$ (= 45) and $"\frac{2100}{10}" - "180"$ (= 30) **or** $"180" \times \frac{25}{100}$ (= 45) and $"180" + "45"$ (= 225) oe and $\frac{2100}{10}$ (= 210) **or** $(\frac{2100}{10} - "180") \div "180" \times 100$ (= 16.6...) **OR** process to compare what all salesmen gets under each scheme, eg $"1260" \times \frac{25}{100}$ (= 315) and $"1470" - "1260"$ (= 210) **or** $"1260" \times \frac{25}{100}$ (= 315) and $"1260" + "315"$ (= 1575) oe and $"1470"$ **or** $("1470" - "1260") \div "1260" \times 100$ (= 16.6...)	
		A1	'No' supported by correct figures, eg 45 and 30, 225 and 210, 315 and 210 **or** 1575 and 1470 **or** 16.(6...)(% and 25%)	Do not award unless correct figures have been shown to support a statement made that the salesman was not correct.

Pearson Edexcel - Thursday 8 November 2018 - Paper 2 (Calculator) Foundation Tier

3.

11	4	M1	for $\frac{30}{100} \times 80$ (=24) oe or for 104	
		M1	(dep) for 28 − "24" or 108 − 104	Numbers in subtraction may be reversed
		A1	for 4 or −4	

Pearson Edexcel - Monday 12 November 2018 - Paper 3 (Calculator) Foundation Tier

4.

11	40	P1	for $100 - 30$ (=70) **or** $1 - 0.3$ (=0.7) or $1 - \frac{3}{10}$ (=$\frac{7}{10}$) **or** $28 \div 7 \times 3$ (=12)	
		P1	for a complete process eg $28 \div$ ("70" $\div$ 10) $\times$ 10 oe **or** $28 +$ "12"	
		A1	cao	

Pearson Edexcel - Thursday 24 May 2018 - Paper 1 (Non-Calculator) Foundation Tier

5.

15	24	M1	for method to find 15% of 160, eg $160 \times \frac{15}{100}$ oe (= 24) **or** 10% = 160 ÷ 10 (= 16) plus 5% = "16" ÷ 2 (= 8) (= 24)	When using partitioning methods, the method to find individual %s must be clear including the need to show an intention to sum eg. 10% = 16 + 5%=8
		A1	cao SC B1 for answer of 136 or 184 if M0 scored	

Pearson Edexcel - Thursday 2 November 2017 - Paper 1 (Non-Calculator) Foundation Tier

6.

15		45	M1	for a correct first step eg $\frac{9}{7+4+9}$ (=$\frac{9}{20}$) **or** $\frac{100}{7+4+9}$ (=5) **or** a full method for one of the other colours
			A1	cao

Pearson Edexcel – Specimen 2 - Paper 1 (Non-Calculator) Foundation Tier

7.

1		32	B1	

8.

13	£5		£5	P1	for $\frac{25}{100} \times 60$
				P1	for process to find difference between totals $20 - \text{"15"}$
				A1	cao

9.

14	a		chart	C1	For key or suitable labels to identify male and female
				C1	For linear scale
				C1	For chart (combined or separate) correctly showing data for at least 2 of swim, run, cycle
				C1	Fully correct chart with axes correctly scaled and labelled.
	b		60	M1	$\frac{8+5+5}{30}$ or ft their diagram
				A1	60%

Pearson Edexcel – Specimen 1 - Paper 2 (Calculator) Foundation Tier

10.

9			62.5	M1	for 12.5 squares or use of 1 sq = 5%
				M1	for $12.5 \div 20 \times 100$ oe
				A1	for 62.5
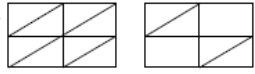
OCR Thursday 07 November 2019- Morning (Non-Calculator) Foundation Tier

11.

12	(a)	Shows 85% and 76%	2		Condone both stated as equivalent decimals or both stated as fractions over 100 for 2 marks.
				M1 for 85% or 0.85 or $\frac{85}{100}$ or 76% or 0.76 or $\frac{76}{100}$ If 0 scored **SC1** for both 85 and 76 **seen**	
12	(b)	80 nfww	3	**M2** for $\frac{17+19}{20+25} \times 100$ oe OR **M1** for $\frac{17+19}{20+25}$ oe **M1 dep** for $\frac{4}{5}$ or $\frac{8}{10}$ or $\frac{80}{100}$	$\frac{85\% + 76\%}{2}$ or $\frac{85+76}{200}$ or leading to an answer of 80 scores 0. Allow 36 out of 45

OCR Monday 11 November 2019 – Afternoon (Calculator) Foundation Tier

12.

| 13 | | | 75 cao nfww | 4 | M1 for inventing a length and width and correct answer to *their* length × *their* width

 M1 for correct area of one triangle

 M1 for *their* rectangle area – 2 × *their* triangle area oe

 OR
 M1 for subdividing shape into right triangles and/or rectangles

 B2 for shaded area = $\frac{6}{8}$ oe of rectangle or

 B1 for one triangle = $\frac{1}{8}$ oe or 12.5% of rectangle oe
 OR
 M1 for recognising two triangles = rectangle

 B2 for shaded area = $\frac{3}{4}$ or oe $\frac{6}{8}$ of rectangle or

 M1 for two triangles = $\frac{1}{4}$ or $\frac{2}{8}$ oe or 25% of rectangle | May be algebraic "*x* by *y*" rectangle (Diagram is 11 cm by 5 cm) Accept equal length and width Or a trapezium = half shaded area

 May be 6 × one triangle or 2 × one trapezium

 e.g.

 May be as 8 triangles make the rectangle

 May be as 8 triangles or 4 rectangles make the rectangle

 Example for 11 by 5
 M1 for 11 × 5 = 55
 M1 for 5.5 × 2.5 ÷ 2 = 6.875
 M1 for 55 – 13.75 = 41.25 |

OCR Tuesday 11 June 2019 – Morning (Calculator) Foundation Tier

13.

| 4 | | | 8 | 2 | M1 for 40 × 0.2 oe | For **M1** oe may be
 40 ÷ 10 × 2 or
 40 ÷ 100 × 20
 Multiplication may be repeated addition |

OCR Thursday 7 June 2018 – Morning (Non-Calculator) Foundation Tier

14.

14			Correct attempt to find 90% or 10% of 110	M1	or $\frac{99.4}{110}$[×100] oe or $\frac{9.5+1.1}{110}$[×100] oe	
			99 or 11 and 10.6	A1	or 90.36 to 90.4 or 9.6[4] and 10	M1 implied by 99 seen or 11 and 10.6 seen or 90.36 or 9.6[4] and 10 seen Be aware of 90.36 or 9.6[4] appearing without written evidence as possible calculator use
			[She is] correct oe	A1	Dep on M1A1 earned	Other methods are possible

OCR Monday 6 November 2017– Morning (Calculator) Foundation Tier

15.

12	a	64	3	B2 for $\frac{64}{100}$ or B1 for $\frac{32}{50}$ or M1 for 32 ÷ 50 x 100 oe	
	b	Valid explanation	1	Such as 'the sample size was too small'	See Appendix

Pearson Edexcel – Sample Papers - Paper 1 (Non-Calculator) Foundation Tier

16.

8		12	M1	M1 for 0.15 × 80 oe **or** 8 + 4
			A1	cao

17.

25		28	P1	Process to start to solve problem eg. $\frac{3}{5} \times 40$ **or** divide any number in the ratio 3:2
			P1	Second step in process to solve problem eg. $\frac{2}{5} \times 10$ or find number of males/females under 25 for candidate's chosen number
			P1	for complete process
			A1	

Pearson Edexcel – Sample Papers - Paper 3 (Calculator) Foundation Tier

18.

9		351	M1	for 2.34 × 150 oe
			A1	

OCR Thursday 25 May 2017 – Morning (Calculator) Foundation Tier

19.

20			34.5	3	M2 for 38.64 ÷ 1.12 oe or B1 for 1.12 or 112	

OCR Thursday 8 June 2017 – Morning (Non - Calculator) Foundation Tier

20.

9	a		12	3	**M2** for 420 ÷ 7 ÷ 5 or 420 ÷ 35 Or **M1** for 420 ÷ 7 **soi** or 420 ÷ 5 **soi**	Condone 12.0, 12.00
	b	i	20% is one day **oe**	1	Or 20% = 1/5	**See Appendix B**
		ii	336	2	**M1** for 420 × 0.8 **oe** or 420 – 84 or *their 12 x 7 x 4* **oe**	

AQA Thursday 4 June 2020 – Morning (Calculator) Foundation Tier

21.

Q	Answer	Mark	Comments
	Alternative method 1 Total % for A after 6 tests – total % for B after 5 tests		
	60×5 or 300 or 52×5 or 260	M1	oe
	$\dfrac{24}{50} \times 100$ or 0.48×100 or 48	M1	oe 348 implies M1M1
	$60 \times 5 + \dfrac{24}{50} \times 100 - 52 \times 5$ or $300 + 48 - 260$ or 88	M1dep	oe eg $348 - 260$ dep on M1M1
	44	A1	allow $\dfrac{44}{50}$
28	**Alternative method 2** Total score for A after 6 tests – total score for B after 5 tests		
	$\dfrac{60}{100} \times 50$ or 30	M1	oe allow $\dfrac{30}{50}$ implied by 150 or 174
	$\dfrac{52}{100} \times 50$ or 26	M1	oe allow $\dfrac{26}{50}$ implied by 130
	$\dfrac{60}{100} \times 50 \times 5 + 24 - \dfrac{52}{100} \times 50 \times 5$ or $150 + 24 - 130$	M1dep	oe eg $174 - 130$ dep on M1M1
	44	A1	allow $\dfrac{44}{50}$

Q	Answer	Mark	Comments
	Alternative method 3 Total score for A after 6 tests – total score for B after 5 tests		
	50×5 or 250	M1	oe implied by 150 or 130 or 174
	$\dfrac{60}{100} \times 50 \times 5$ or 150 and $\dfrac{52}{100} \times 50 \times 5$ or 130	M1dep	oe allow $\dfrac{150}{250}$ and $\dfrac{130}{250}$
	$\dfrac{60}{100} \times 50 \times 5 + 24 - \dfrac{52}{100} \times 50 \times 5$ or $150 + 24 - 130$	M1dep	oe eg $174 - 130$
28 cont	44	A1	allow $\dfrac{44}{50}$
	Alternative method 4 Difference in scores after 5 tests + 6th score for A		
	$60 - 52$ or 8	M1	oe
	$\dfrac{60-52}{100} \times 50$ or 4	M1dep	oe eg $\dfrac{60}{100} \times 50 - \dfrac{52}{100} \times 50$ or $30 - 26$ allow $\dfrac{4}{50}$
	$\dfrac{60-52}{100} \times 50 \times 5 + 24$ or $4 \times 5 + 24$ or $20 + 24$	M1dep	oe
	44	A1	allow $\dfrac{44}{50}$

	Additional Guidance	
28 cont	To award the 3rd M a calculation or a value (not an equation) must be seen	
	Select the scheme that favours the student for the first 2 M marks even if not subsequently used	
	Alt 1 Do not award 1st M for 300 if incorrect method seen eg 6 × 50 = 300 does not score the 1st M	
	Alt 1 Do not award 2nd M for 48 if incorrect method seen eg 100 − 52 = 48 does not score the 2nd M	
	Alt 2 Do not award 2nd M for 26 if incorrect method seen eg 50 − 24 = 26 does not score the 2nd M	

AQA Tuesday 21 May 2019 – Morning (Non-Calculator) Foundation Tier

22.

	Alternative method 1		
22	$3 \div \dfrac{20}{100}$ or 3×5 or 15 or 3×6	M1	oe
	18	A1	
	Alternative method 2		
	$1.2x = x + 3$	M1	oe equation
	18	A1	
	Additional Guidance		
	Trial and improvement scores 0 or 2 unless M1 can be awarded for 15		
	15 seen scores M1		

23.

	Alternative method 1		
	$(65\% =) \dfrac{13}{20}$ or 7 : 13	M1	
	13	A1	must be selected as the answer
	Alternative method 2		
	$(100 - 35) \div 35 \times 7$ or $7 \div 35 \times 100 - 7$ or $20 - 7$	M1	oe eg $35 \div 7 = 5$ and $65 \div 5$
	13	A1	must be selected as the answer
	Alternative method 3		
25	$\dfrac{35}{7} \times n = 100 - 35$ or $5n = 65$	M1	oe equation eg $\dfrac{7}{n} = \dfrac{35}{100 - 35}$ or $35n = 455$
	13	A1	must be selected as the answer
	Additional Guidance		
	35 : 65 with no other valid working		M0
	Condone answer £13		M1A1
	Answer 13% or 13n		M1A0
	65% = 0.65		M0
	Alt 2 $65 \div 35 = 1.9$ $1.9 \times 7 = 13.3$ (evidence of premature approximation) Answer 13		M1 A0
	Alt 2 $65 \div 35 = 1.9$ $1.9 \times 7 = 13$ (assume full calculator value used)		M1 A1

24.

30	**Alternative method 1**		
	280 − 80 or 200	M1	
	their 200 ÷ 80 (× 100) or 2.5 (× 100)	M1dep	oe
	250	A1	
	Alternative method 2		
	280 ÷ 80 or 3.5	M1	oe
	280 ÷ 80 × 100 (− 100) or their 3.5 × 100 (− 100) or 350 (− 100) or (their 3.5 − 1) (× 100) or 2.5 (× 100)	M1dep	oe
	250	A1	

25.

	Alternative method 1		
24	Any one of 60 000 ÷ 420 000 or 0.14… or 14.(…)% or $\frac{1}{7}$ or 480 000 ÷ 420 000 or 1.14… or 114.(…)% or $\frac{8}{7}$ or 420 000 ÷ 60 000 or 7 or 420 000 ÷ 480 000 or 0.875 or 87.5% or $\frac{7}{8}$ or 60 000 ÷ 540 000 or 0.11… or 11.(…)% or $\frac{1}{9}$ or 540 000 ÷ 60 000 or 9	M1	oe eg 60 000 : 420 000 or 1 : 7 or 480 000 : 420 000 or 8 : 7
	Any one of 60 000 ÷ 480 000 or 0.125 or 12.5% or $\frac{1}{8}$ or 540 000 ÷ 480 000 or 1.125 or 112.5% or $\frac{9}{8}$ or 480 000 ÷ 60 000 or 8 or 480 000 ÷ 540 000 or 0.88… or 0.89 or 88.(…)% or 89% or $\frac{8}{9}$	M1	must be a matching pair (could be different forms) to award M2 (see A1 for list of matching pairs) oe eg 60 000 : 480 000 or 1 : 8 or 540 000 : 480 000 or 9 : 8

Mark scheme continues on the next page

24 cont	$\frac{1}{7}$ and $\frac{1}{8}$ and No or $\frac{8}{7}$ and $\frac{9}{8}$ and No or 0.14… and 0.125 and No or 14.(…)% and 12.5% and No or 1.14… and 1.125 and No or 114.(…)% and 112.5% and No or 7 and 8 and No or $\frac{7}{8}$ and $\frac{8}{9}$ and No or $\frac{1}{9}$ and $\frac{1}{8}$ and No or 9 and 8 and No or 0.11… and 0.125 and No or 11.(…)% and 12.5% and No or 0.875 and 0.88… or 0.89 and No or 87.5% and 88.(…)% or 89% and No	A1	oe eg 1 : 7 and 1 : 8 and No

Mark scheme continues on the next page

	Alternative method 2		
24 cont	No and any one of $\dfrac{60\,000}{420\,000} \times 480\,000$ and [67 200, 68 640] or $\dfrac{60\,000}{480\,000} \times 540\,000$ and 67 500 or $\dfrac{60\,000}{480\,000} \times 420\,000$ and 52 500 or $\dfrac{60\,000}{540\,000} \times 480\,000$ and [52 800, 53 334] or $\dfrac{420\,000}{480\,000} \times 540\,000$ and 472 500 or $\dfrac{480\,000}{420\,000} \times 480\,000$ and [547 200, 548 640] or $\dfrac{480\,000}{540\,000} \times 480\,000$ and [422 400, 427 200] or $\dfrac{540\,000}{480\,000} \times 420\,000$ and 472 500	B3	oe B2 any one of the calculations B1 any one of the fractions oe for equivalent fractions, decimals and percentages see Alternative method 1

Additional guidance continues on the next page

	Additional Guidance	
24 cont	In Alt 1, for M2 the matching pair do not have to be in comparable form eg 14.3% and $\frac{1}{8}$ and No	M1M1A0
	For comparable fractions, they must be in their lowest terms or have the same numerators or the same denominators for the A1 eg Alt 1 $\frac{60\ 000}{420\ 000}$ and $\frac{60\ 000}{480\ 000}$ and No	M1M1A1
	For comparable ratios, they must be in their lowest terms or have the same LH sides or the same RH sides for the A1 eg Alt 1 60 000 : 420 000 and 60 000 : 480 000 and No	M1M1A1
	If working with percentages, condone absence of % symbol eg Alt 1 14 and 12.5 and No	M1M1A1
	Both are increases of 60 000 and it is then over different amounts so cannot be the same percentage	M0M0A0

AQA Thursday 2 November 2017 – Morning (Non-Calculator) Foundation Tier

26.

	Alternative method 1		
15	Method for finding a percentage beyond 5% or 1%	M1	eg 6.2 ÷ 2 or 3.1 (0.5%) 31 + 6.2 or 37.2 (6%) 31 × 2 or 62 (10%) 6.2 + 6.2 or 12.4 (2%) 31 × 3 or 93 (15%) 6.2 × 3 or 18.6 (3%)
	Fully correct method that would lead to the correct answer	M1dep	eg their 93 – their 12.4 (their 3.1 + their 37.2) × 2 their 62 + their 18.6
	80.6	A1	

Alternative method 2 is on the next page

15 cont	**Alternative method 2**		
	6.2 × 13 or 62 × 13	M1	may be implied
	10 × 6.2 + 3 × 6.2 or 62 + 18.6 or 6 × 13 + 0.2 × 13 or 78 + 2.6 or digits 806 other than 80.6	M1dep	<u>From traditional method</u> their 186 + their 620 or their 26 + their 780 at least one correct and placeholder of zero correct or implied <u>From grid method</u> their 600 + their 20 + their 180 + their 6 at least three correct <u>From Chinese / Napier's bones method</u> at least three values correct from (0)/6, (0)/2, (0)/6 and 1/8 and then appropriate diagonal adding
	80.6	A1	
	Additional Guidance		
	In all cases, accept repeated addition for multiplication eg accept 31 + 31 for 2 × 31		
	Ignore a % sign after 80.6		

27.

	Alternative method 1		
	80 × 0.55 or 44 or 120 × 0.7 or 84	M1	oe
	80 × 0.55 + 120 × 0.7 or 44 + 84 or 128	M1dep	Correct method for both
	(80 + 120) × 0.65 or 130 or their 128 ÷ (80 + 120) × 100 or their 128 ÷ 2 or 64	M1	65% of total marks available or their total score for Riya as a percentage of full marks
	128 and 130 and No or 64 and No	A1	oe eg No, she needed 130 but was 2 marks short oe eg 0.64 and 0.65 and No
15	**Alternative method 2** – marks not scored		
	80 × 0.45 or 36 or 120 × 0.3 or 36	M1	oe
	80 × 0.45 + 120 × 0.3 or 36 + 36 or 72	M1dep	Correct method for both
	(80 + 120) × 0.35 or 70 or their 72 ÷ (80 + 120) × 100 or their 72 ÷ 2	M1	35% of total marks available or their total score for Riya as a percentage of full marks
	72 and 70 and No or 36 and 35 and No	A1	oe eg No, she failed by 2 marks oe eg 0.36 and 0.35 and No

Alternative methods 3 and 4 and additional guidance continue on the next two pages

	Alternative method 3		
	80 × 0.55 or 44	M1	oe
	(80 + 120) × 0.65 or 130	M1	65% of total marks available
	their 130 – their 44 or 86 and 120 × 0.7 or 84 or their 130 – their 44 or 86 and their 86 ÷ 120 × 100 or 71.6... or 72	M1dep	dep on M1M1
15 cont	86 and 84 and No or 71.6... or 72 and 70 and No	A1	oe eg No, she needed 2 more marks on B oe eg No, she needed 1.6% more on B
	Alternative method 4		
	120 × 0.7 or 84	M1	oe
	(80 + 120) × 0.65 or 130	M1	65% of total marks available
	their 130 – their 84 or 46 and 80 × 0.55 or 44 or their 130 – their 84 or 46 and their 46 ÷ 80 × 100 or 57.5	M1dep	dep on M1M1
	46 and 44 and No or 57.5 and 55 and No	A1	oe eg No, she needed 2 more marks on A oe eg No, she needed 2.5% more on A

Additional guidance continues on the next page

	Additional Guidance	
	Build up steps for percentages must be correct or have fully correct method shown for any incorrect steps	
	eg1 50% = 40, 5% = 16, section A = 56	M0
	eg2 50% = 40, 5% = 80 × 0.05 = 16, section A = 56	M1
15 cont	Ignore % signs given with marks eg 44%	
	128 and she needs 2 more marks implies No	M1M1M1A1
	55 + 70 = 125	M0M0
	125 → 62.5% and No	M1A0
	Allow misread of 55% of 120 and 70% of 80 for method marks	max M3

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28.

	33 + 75 or 108 seen or 60 + 100 or 160 seen	M1	
	(33 + 75) ÷ (60 + 100) (× 100) or their 108 ÷ their 160 (× 100) or 0.675 (× 100)	M1dep	oe
20	67.5 or 68	A1	
	Additional Guidance		
	67.5 or 68		M1M1A1
	108 ÷ 160 = 0.67 67		M1M1A0
	0.675 67		M1M1A0
	67 with no working		M0M0A0

AQA Sample Paper 1– Morning (Non-Calculator) Foundation Tier

29.

8	Complete, correct build up method or 0.51×400	M1	eg $400 \div 2 + 400 \div 100$ oe
	204	A1	

AQA Sample Paper 3– Morning (Calculator) Foundation Tier

30.

16	24 + 45 + 281 + 50 or 400	M1	
	0.18 × their 400 or 72	M1	oe
	their 72 − 45 or 27	M1	
	23	A1	