

**FRACTIONS, DECIMALS AND PERCENTAGES**

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

2.

1	(a)	$\frac{95}{28}$	M1	for a method to add using common denominators with at least one fraction correct (matching numerator with common denominator) eg $\frac{60}{28} + \frac{35}{28}$ <b>or</b> $(2)\frac{4}{28} + (1)\frac{7}{28}$	Use of decimals gets no credit unless it leads to a correct fraction
			A1	$\frac{95}{28}$ oe eg $3\frac{11}{28}$	
	(b)	$1\frac{3}{5}$	M1	for $\frac{6}{5} \times \frac{4}{3}$ <b>or</b> $\frac{24}{20} \div \frac{15}{20}$ <b>or</b> $\frac{8}{5}$ oe eg $1\frac{9}{15}$	Use of decimals gets no credit unless it leads to a correct fraction
			A1	cao	

**Pearson Edexcel - Monday 9 June 2014 - Paper 1 (Non-Calculator) Higher Tier**

4.

1	(a)		$\frac{2}{21}$	1	B1 for $\frac{2}{21}$
	(b)		$\frac{4}{15}$	2	M1 for attempting to use a suitable common denominator with at least one of the two fractions correct A1 for $\frac{4}{15}$ oe

**Pearson Edexcel - Wednesday 6 November 2013 - Paper 1 (Non-Calculator) Higher Tier**

5.

20	(a)		4	3	M1 for correct expansion to $32x - 8$ or multiplying both sides by $3x$ or dividing both sides by $4$ M1 for a complete and correct method to isolate the $x$ terms and the number terms (condone one arithmetic error in multiplying out the bracket) A1 cao
	(b)	$\frac{2(y-6)-(y+3)}{(y+3)(y-6)}$	$\frac{y-15}{(y+3)(y-6)}$	3	M1 for common denominator of $(y+3)(y-6)$ M1 for $\frac{2(y-6)}{(y+3)(y-6)} - \frac{y+3}{(y+3)(y-6)}$ oe or $\frac{2(y-6)-(y+3)}{(y+3)(y-6)}$ oe A1 for $\frac{y-15}{(y+3)(y-6)}$ or $\frac{y-15}{y^2-3y-18}$

**Pearson Edexcel - Monday 11 June 2012 - Paper 1 (Non-Calculator) Higher Tier**

6.

24		eg. $x = 0.28181\dots$ $100x = 28.181\dots$  $99x = 27.9$	$\frac{31}{110}$	3	M1 for 0.28181(...) or 0.2 + 0.08181(...) or evidence of correct recurring decimal eg. 281.81(...) M1 for two correct recurring decimals that, when subtracted, would result in a terminating decimal, and attempting the subtraction eg. $100x = 28.1818\dots, x = 0.28181\dots$ and subtracting  eg. $1000x = 281.8181\dots, 10x = 2.8181\dots$ and subtracting  OR $\frac{27.9}{99}$ or $\frac{279}{990}$ oe A1 cao
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**Pearson Edexcel - Wednesday 9 November 2011 - Paper 3 (Non-Calculator) Higher Tier**

7.

1	(a)	$\frac{4}{20} = \frac{2}{10}$	$\frac{1}{5}$	2	M1 $\frac{4}{20}$ oe A1 cao [SC: B1 fo $\frac{16}{20}$ if M0 scored ]
	(b)	$\frac{6}{20} \times 100$ or $\frac{6}{20} = \frac{5 \times 6}{5 \times 20}$	30	2	M1 $\frac{6}{20} \times 100$ A1 cao or M1 $\frac{6}{20} = \frac{5 \times 6}{5 \times 20}$ A1 cao
	(c)	$10 - 1.50 = 8.50$ $8.50 \div 2 = 4.25$ or $10 \div 2 = 5$ $1.50 \div 2 = 0.75$	5.75	2	M1 $10 - 1.50 (= 8.50)$ and $'8.50' \div 2 (= 4.25)$ or $10 + 1.50 (= 11.50)$ and $'11.50' \div 2$ or $10 \div 2$ and $1.50 \div 2$ or $2x \pm 1.5(0) = 10$ oe A1 cao

**Pearson Edexcel - Friday 12 November 2010 - Paper 4 (Calculator) Higher Tier**

8.

3	$B = 20 \times 2 = 40$ $C = 3 \div 4 \times 20 = 15$ $D = 10 \div 100 \times 20 + 20 = 22$ $20 + 40 + 15 + 22$	97	4	M1 for $20 \times 2$ or 40 seen M1 for $3 \div 4 \times 20$ or 15 seen M1 for $10 \div 100 \times 20 + 20$ oe or 22 seen or $1.1 \times 20$ A1 cao
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**Pearson Edexcel - Thursday 5 November 2009 - Paper 3 (Non-Calculator) Higher Tier**

9.

1	(a)		173160	1	B1 cao
	(b)		173.16	1	B1 cao

**OCR GCSE – Thursday 7 November 2019 – Paper 5 (Non-Calculator) Higher Tier**

10.

10			300	5	<b>M4</b> for $36 + 0.12 \text{ oe}$ or <b>M1</b> for $0.3 \times 0.4 \text{ oe}$ <b>A1</b> for $0.12 \text{ oe}$ OR <b>M1</b> for $36 + 0.3 \text{ oe}$ <b>A1</b> for 120  <b>M1</b> for <i>their</i> $120 \div \frac{2}{5} \text{ oe}$ seen  <b>A1FT</b> for <i>their</i> $120 + \frac{2}{5} \text{ oe}$ correctly evaluated to nearest integer or better seen	e.g. Answer 420 from $300 + 120$ , gets M1A1M1A1
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**OCR GCSE – Thursday 7 November 2019 – Paper 5 (Non-Calculator) Higher Tier**

11.

13	(a)	(i)	[0].3	1		Condone e.g. [0].33
13		(ii)	[0].03	1		Condone e.g. [0].033
13	(b)		$4\sqrt{5}$	3	<b>B2</b> for $\frac{20\sqrt{5}}{5}$ or <b>M1</b> for $\frac{20}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$ or better	

**OCR GCSE – Thursday 6 June 2019 – Paper 5 (Non-Calculator) Higher Tier**

12.

10	(a)		0.16 final answer	2	<b>B1</b> for 0.16....	Accept unambiguous alternate notation for the recurring decimal e.g. B1 for 0.166, 0.168, 0.16
	(b)		She is correct <b>oe</b> OR She is not correct <b>oe</b> AND 7 [and] 45 <b>and</b> 14 [and] 90 or 14 [and] 90 <b>and</b> 14k [and] 90k shown	4	<b>B3</b> for $\frac{7}{45}$ <b>and</b> $\frac{14}{90}$ or for $\frac{14}{90}$ <b>and</b> $\frac{14k}{90k}$ or <b>B2</b> for $\frac{14}{90}$ <b>oe</b> fraction or <b>M1</b> for $1.5... [\times 10^n]$ <b>and</b> $15.5... [\times 10^n]$ <b>seen</b>	For 4 marks there must be no incorrect fractions shown Accept yes for she is correct and no for she is not correct  Where $k$ is a positive integer For B2 and B3 accept as pairs of values instead of fractions  Where $n$ is an integer e.g. allow M1 for 0.15... and 1.5... or for 15.5.. and 155.5...

**OCR GCSE – Monday 12 November 2018 – Paper 6 (Calculator) Higher Tier**

13.

14	(a)		$x = 0.191919...$ $100x = 19.191919...$ $99x = 19$  $x = \frac{19}{99}$	3	<b>M1</b> for $100x = 19.191919...$ and <b>M1</b> for $100x - x = 19.191919... - 0.191919... \text{ or better}$	For full marks, clear step by step process must be evident  Apply marks in a similar way to other methods e.g. <b>M1</b> and <b>M1</b> for $10000x - 100x = 1919.1919... - 19.1919...$
	(b)		$0.19 \div 10$ or "divide by 10"  $= 0.019$	1  <b>1 dep</b>	Dependent on first mark	Answer only scores <b>0</b>

OCR GSCE – Thursday 7 June 2018 – Paper 5 (Non - Calculator) Higher Tier

14.

13	(a)		$0.41\overline{6}$	2	B1 for answer 0.41...	For 2 marks accept e.g. 0.4166[6]... or 0.416r
	(b)		$\frac{76}{99}$	2	Mark final answer M1 for 76.76... <b>seen</b> or answer $\frac{k}{99}$	

OCR GSCE – Tuesday 6 November 2017 – Paper 5 (Non - Calculator) Higher Tier

15.

12	(a)		0.83	2	M1 for division attempt leading to 0.8.....	Accept 0.833[3].....
	(b)		$\frac{19}{150}$ as final answer	3	B2 for $\frac{114k}{900k}$ <b>oe</b> or M1 for 126.66... and 12.66... or better  or fraction $\frac{k}{900}$ or $\frac{k}{9900}$ <b>seen</b>	Sets up a 'pair' to eliminate the recurrence Accept eg 12.666.. and 0.126...

OCR GSCE – Thursday 8 June 2017 – Paper 5 (Non - Calculator) Higher Tier

16.

*1			$\frac{1}{11}$ final answer	2	M1 for $\frac{30}{330}$ <b>oe</b> or correct cancelling shown  After 0 scored, <b>SC1</b> for <i>their</i> fraction written in simplest form	For M1, condone 1 correct stage of cancelling common factors in numerators and denominators  SC1 dep on a fraction that reduces
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OCR GSCE – Thursday 8 June 2017 – Paper 5 (Non - Calculator) Higher Tier

17.

13	(a)		0.7	1		Condone poor notation e.g. 0.777..., $0.\dot{7}\dot{7}$ , $0.7^r$
	(b)		35 [and] 11 or 70 [and] 22 final answer	3	B2 for $\frac{315}{99}$ or $3\frac{18}{99}$ Or B1 for $\frac{18}{99}$ Or M1 for 318.18... or 18.18... seen	For 3 marks, accept in either order B2 implied by answer 315 and 99

OCR GSCE – Sample Papers – Paper 6 (Calculator) Higher Tier

18.

<b>15</b>		Correct solutions, e.g. $\frac{1}{4} = \frac{1}{6} + \frac{1}{12}$ $\frac{1}{5} = \frac{1}{6} + \frac{1}{30}$ $\frac{1}{6} = \frac{1}{9} + \frac{1}{18}$	<b>3</b> 1 A01.1 2 A03.1a	<b>B1</b> for each Allow any correct example, e.g. $\frac{1}{4} = \frac{1}{5} + \frac{1}{20}$ $\frac{1}{6} = \frac{1}{7} + \frac{1}{42}$	
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**OCR GCSE – Tuesday 13 June 2017 – Paper 6 (Calculator) Higher Tier**

**19.**

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>1</b>	$\frac{19}{4}$	<b>B1</b>	

**AQA GCSE – Tuesday 19 May 2020 – Paper 1 (Non - Calculator) Higher Tier**

**20.**

<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>4</b>	$\frac{6}{5}$	<b>B1</b>	

**AQA GCSE – Tuesday 19 May 2020 – Paper 1 (Non - Calculator) Higher Tier**

**21.**

<b>11</b>	<b>Alternative method 1</b>		
	0.275 × 3 or 0.825 or 0.275 ÷ 10 or 0.0275	M1	oe
	0.0825	A1	
	<b>Alternative method 2</b>		
	0.08... from division of 33 by 400 or 0.08... from division of 3.3 by 40	M1	
	0.0825	A1	
	<b>Alternative method 3</b>		
	$33 \times \frac{1000}{400}$ or $33 \times 2.5$ or $33 \div 4$ or $0.33 \div 4$ or digits 825	M1	oe
	0.0825	A1	

AQA GCSE – Tuesday 19 May 2020 – Paper 1 (Non - Calculator) Higher Tier

22.

<b>19</b>	$\frac{3x}{10}$	B1	
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AQA GCSE – Thursday 8 June 2020 – Paper 3 (Calculator) Higher Tier

23.

Q	Answer	Mark	Comments	
13(a)	$\frac{5a^2}{4}$ or $1\frac{1}{4}a^2$	B2	B1 correct single fraction not in simplest form eg $\frac{50a^2}{40}$ or $1.25a^2$ or $\frac{5}{4}a$ or $\frac{5a}{4}$ or $1\frac{1}{4}a$	
	<b>Additional Guidance</b>			
	Final answer $1.25a^2$ (even if $\frac{5a^2}{4}$ seen in working)		B1	

Q	Answer	Mark	Comments
13(b)	Valid evaluation	B1	eg she needs to divide 10 by 2 or the answer should be $3c + 5$
	<b>Additional Guidance</b>		
	Do not award marks when an incorrect statement or incorrect algebra is seen with a correct statement or correct algebra		
	She needs to add 5 not 10	B1	
	She must divide all of the numerator by 2	B1	
	She must divide everything by 2	B1	
	She should divide both sides by 2	B0	
	She needs to work out $6c + 10$ then divide by 2	B0	
	Her method is wrong	B0	
$3c + 5$ alone	B0		

AQA GCSE – Tuesday 11 June 2019 – Paper 3 (Calculator) Higher Tier

24.

1	$\frac{5}{2}$	B1	
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25.

<b>5</b>	<b>Alternative method 1</b>		
	$\frac{17}{2}$ or $\frac{8}{3}$	M1	oe fractions
	their $\frac{17}{2}$ × their $\frac{3}{8}$	M1	conversion of both mixed numbers to improper fractions and multiplication of the conversion of $8\frac{1}{2}$ by the reciprocal of the conversion of $2\frac{2}{3}$
	$\frac{51}{16}$	A1	oe fraction or decimal
	$3\frac{3}{16}$	B1ft	oe mixed number ft correct conversion of their improper fraction to a mixed number
	<b>Alternative method 2</b>		
	$\frac{17}{2}$ or $\frac{8}{3}$	M1	oe fractions
	$\frac{51}{6} \div \frac{16}{6}$	M1	conversion of both mixed numbers to improper fractions, correct conversion to improper fractions with a common denominator and division of the conversion of $8\frac{1}{2}$ by the conversion of $2\frac{2}{3}$
	$\frac{51}{16}$	A1	oe fraction or decimal
	$3\frac{3}{16}$	B1ft	oe mixed number ft correct conversion of their improper fraction to a mixed number

The Additional Guidance for question 5 is on the next page



		Additional Guidance	
<b>5 cont</b>	Working with decimals	0, 3 or 4	
	Ignore incorrect attempt to simplify a mixed number eg $3\frac{3}{16} = 3\frac{1}{8}$	M1M1A1B1	
	$3\frac{3}{16}$ seen, then $\frac{51}{16}$ on answer line	M1M1A1B0	
	$\frac{9}{2}$ and $\frac{8}{3}$ , $\frac{27}{6} + \frac{16}{6}$ , $\frac{27}{16}$ , $1\frac{11}{16}$	M1M1A0B1ft	
	$\frac{9}{2}$ and $\frac{8}{3}$ , $\frac{27}{6} + \frac{16}{6}$ , $1\frac{11}{16}$	M1M1A0B1ft	
	$\frac{9}{2}$ and $\frac{4}{3}$ , $\frac{27}{6} + \frac{8}{6}$ , $\frac{27}{8}$ , $3\frac{3}{8}$	M0M1A0B1ft	

AQA GCSE – Monday 12 November 2018 – Paper 3 (Calculator) Higher Tier

26.

<b>2</b>	$\frac{5}{2}$	B1	
	Additional Guidance		

AQA GCSE – Monday 24 May 2018 – Paper 1 (Non - Calculator) Higher Tier

27.

<b>6</b>	$\frac{1.86}{1.6(0)}$	M1	oe $\frac{0.93}{0.8(0)}$ or $1\frac{0.26}{1.6}$	
	$\frac{186}{160}$ or $1\frac{26}{160}$	A1	oe with no decimal values	
	$\frac{93}{80}$ or $1\frac{13}{80}$	B1ft	ft correct simplification of their fraction using the digits 186 and 16(0) ignore incorrect conversion from $\frac{93}{80}$ to a mixed number	
	<b>Additional Guidance</b>			
	Cannot score B1ft from an incorrect mixed number			
	$\frac{160}{186} = \frac{80}{93}$			M0A0B1ft
	$\frac{80}{93}$ implies B1ft			M0A0B1ft
	$\frac{93}{80} = 1\frac{3}{80}$ (incorrect conversion to mixed number)			M1A1B1
	$\frac{186}{160} = \frac{31}{30}$ (incorrect simplification of fraction)			M1A1B0
	$\frac{93}{80} = \frac{31}{30}$ (incorrect simplification of fraction)			M1A1B0
	$\frac{93}{80} = \frac{0.93}{0.8}$ (incorrect simplification of fraction)			M1A1B0
	$\frac{186}{16} = \frac{93}{8}$			M0A0B1ft
	$\frac{1.86}{1.6} = \frac{9.3}{8}$			M1A0B0
$\frac{1.86}{1.6} = \frac{186}{16} = \frac{93}{8}$			M1A0B1ft	
$\frac{1.86}{1.6} = \frac{86}{60} = \frac{43}{30}$ (simplification does not come from 186 and 16(0))			M1A0B0	

AQA GCSE – Monday 24 May 2018 – Paper 1 (Non - Calculator) Higher Tier

28.

<b>23</b>	<b>Alternative method 1</b>		
	$\frac{6}{5}$ or $\frac{3}{4}$	M1	oe fractions, decimals or percentages, but not $\frac{6}{5}$ as a mixed number
	$\frac{6}{5} \times \frac{3}{4}$ or $\frac{18}{20}$ or $\frac{9}{10}$ or 0.9 or 90% or 0.1 or 10%	M1dep	oe fractions or decimals, but not $\frac{6}{5}$ as a mixed number
	$\frac{1}{10}$	A1	oe fraction
	<b>Alternative method 2</b>		
	Chooses value for price and increases by $\frac{1}{5}$ or chooses number of laptops and decreases by $\frac{1}{4}$	M1	correct method or value for either eg (£)5 and (£)6 or 20 (laptops) and 15 (laptops)
	Chooses value for price and increases by $\frac{1}{5}$ and chooses number of laptops and decreases by $\frac{1}{4}$ and $\frac{\text{reduced income}}{\text{original income}} (\times 100)$ or $\frac{\text{reduction}}{\text{original}} (\times 100)$	M1dep	correct method or values  eg $\frac{6 \times 15}{5 \times 20} (\times 100)$ or $\frac{5 \times 20 - 6 \times 15}{5 \times 20} (\times 100)$
	$\frac{1}{10}$	A1	oe fraction
	<b>Additional Guidance</b>		
	For full marks, accept a fraction equivalent to $\frac{1}{10}$ incorrectly simplified, but not converted to a decimal or percentage	M1M1A1 M1M1A0	
	If both methods tried and answer incorrect, award better method mark		
Accept variables in any working for M1M1			

AQA GCSE – Tuesday 12 June 2018 – Paper 3 (Calculator) Higher Tier

29.

1	0.56	B1	
	<b>Additional Guidance</b>		

AQA GSCE – Thursday 6 November 2017 – Paper 2 (Calculator) Higher Tier

30.

1	$\frac{31}{8}$	B1	
	<b>Additional Guidance</b>		

AQA GSCE – Wednesday 25 May 2017 – Paper 1 (Non - Calculator) Higher Tier

31.

7	$162 \times \frac{5}{3}$ or $162 \div \frac{3}{5}$ or $162 \times 5$ or 810 or $162 \div 3$ or 54	M1	oe $162 \div 0.6$	
	270	A1		
	<b>Additional Guidance</b>			
	For $162 \times \frac{5}{3}$ as a decimal, allow $162 \times 1.66$ or better truncation or rounding or $162 \times 1.67$ for M1			
	97.2		MOA0	

AQA GSCE – Wednesday 25 May 2017 – Paper 1 (Non - Calculator) Higher Tier

32.

15	3	B1	
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AQA GSCE – Thursday 8 June 2017 – Paper 2 (Calculator) Higher Tier

33.

1	0.049	B1	
	<b>Additional Guidance</b>		

**AQA GSCE – Sample Paper 1 (Non - Calculator) Higher Tier**

**34.**

7	$\frac{11}{4} \times \frac{12}{7}$	M1	Converts both fractions to improper with at least one correct
	$\frac{\text{their } 11 \times \text{their } 12}{\text{their } 4 \times \text{their } 7}$ or $\frac{132}{28}$ or $4\frac{20}{28}$ or $\frac{33}{7}$	M1dep	oe fraction
	$4\frac{5}{7}$	A1	

**AQA GSCE – Sample Paper 1 (Non - Calculator) Higher Tier**

**35.**

<b>27</b>	<b>Alternative method 1</b>		
	$(n = 0.17272\dots \text{ and})$ $100n = 17.272\dots$	M1	oe eg $10n = 1.7272\dots$ and $1000n = 172.72\dots$
	$99n = 17.272\dots - 0.17272\dots$ or $99n = 17.1$ or $\frac{17.1}{990}$ or $\frac{171}{990}$ or $\frac{57}{330}$	M1dep	oe eg $990n = 172.72\dots - 1.7272\dots$ or $990n = 171$
	$\frac{19}{110}$	A1	
	<b>Alternative method 2</b>		
	$0.07272\dots = \frac{72}{990}$	M1	
	$(\frac{1}{10} + \frac{72}{990} =) \frac{99}{990} + \frac{72}{990}$ or $\frac{171}{990}$ or $\frac{57}{330}$	M1dep	
	$\frac{19}{110}$	A1	

**AQA GCSE – Sample Paper 2 (Calculator) Higher Tier**

**36.**

<b>5</b>	$\frac{4}{5}$ or 80% seen or used	M1	oe May be implied
	$29.4(0) \times 5 \div 4$ or $147 \div 4$ or $29.4(0) \div 4 (\times 5)$ or $7.35 (\times 5)$ or $29.4(0) \div 0.8$	M1	oe
	36.75	A1	