FRACTIONS

Pearson Edexcel - Tuesday 19 May 2020 - Paper 1 (Non-Calculator) Higher Tier

1.

2	Shown	M1	for conversion to improper fractions eg. $\frac{7}{3}$ **or** $\frac{15}{4}$	Need not be shown with operators
		M1	(dep) for method to multiply fractions,	
			eg. $\frac{7\times15}{3\times4}(=\frac{105}{12})$ **or** $\frac{28\times45}{12\times12}(=\frac{1260}{144})$ oe	
		C1	for complete working showing each stage as far as $\frac{35}{4}$ or $8\frac{9}{12}$	

Pearson Edexcel - Tuesday 19 May 2020 - Paper 1 (Non-Calculator) Higher Tier

2.

9	$5\frac{3}{5}$	M1	for writing as improper fractions with at least one correct, eg $\frac{7}{2}\times\frac{8}{5}$ oe	
		M1	(dep) for multiplying improper fractions,	
			eg $\frac{"56"}{"10"}$ **or** $5\frac{6}{10}$ **or** $\frac{28}{5}$ oe	
		A1	cao	

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

3.

12	(a)	$\frac{4x-6}{3x-9}$	M1	factorises numerator of $4x^2-9$ eg $(2x-3)(2x+3)$ oe	$\frac{2x(2x-3)(2x+3)}{3x(2x+3)(x-3)}$
			M1	factorises denominator eg $x(x-3)$ or $3(2x+3)$ or for $3x(2x^2-3x-9)$	
			A1	cancels to give $\frac{4x-6}{3x-9}$	Accept $a=4, b=-6, c=3, d=-9$
	(b)	$\frac{-x+8}{x(x+1)(x-2)}$	M1	method to use a common denominator eg $x(x+1)(x-2)$ by multiplying terms	Method must involve finding equivalents for all three separate terms; may be done in several stages.
			M1	deduce numerator eg $3x(x-2)+x(x+1)-4(x+1)(x-2)$	
			A1	oe	Equivalents must be algebraically equivalent and must have involved full simplification.

Pearson Edexcel - Thursday 4 June 2015 - Paper 1 (Non-Calculator) Higher Tier

4.

23			$\frac{14}{3}$	5	M1 for correct substitution into a volume formula for a cylinder or a cone, eg. $\frac{1}{3}\times\pi\times3^2\times4$ $(=12\pi)$ or $\pi\times3^2\times(6-4)$ $(=18\pi)$ or $\pi\times3^2\times h$ $(=9\pi h)$ or $\pi\times3^2\times(h-2)$ M1 for method to find volume after 5 hours, eg. "12π" + "18π" $(=30\pi)$ M1 (dep on M1) for use of a correct ratio, eg. "30π" $\times\frac{9}{5}$ $(=54\pi)$ or "30π" $\times\frac{4}{5}$ $(=24\pi)$ M1 for deriving an equation in h, eg. "54π" = "$9\pi h$" + "12π" A1 for $\frac{14}{3}$ or equivalent fraction

Pearson Edexcel - Monday 6 June 2011 - Paper 3 (Non-Calculator) Higher Tier

5.

16	(a)	$\frac{2}{3} \times \frac{6}{5}$	$\frac{4}{5}$	3	M1 for $\frac{2}{3} \times \frac{6}{5}$ M1 for $\frac{2 \times 6}{3 \times 5}$ or 12/15 oe A1 cao
	(b)	$(2-1) + \frac{5}{15} - \frac{6}{15}$ or $\frac{35}{15} - \frac{21}{15}$ Or (tables)	$\frac{14}{15}$	3	M1 for attempt to find a common denominator or sight of $\frac{5}{15}$ or $\frac{6}{15}$ or $\frac{35}{15}$ or $\frac{21}{15}$ oe or fully correct table A1 for sight of $\frac{5}{15} - \frac{6}{15}$ or $\frac{35}{15} - \frac{21}{15}$ oe A1 for $\frac{14}{15}$ oe Alternative M1 for 0.33(3...) or 0.4 OR 2.33(3...) or 1.4 A1 for 0.33(3...) − 0.4 OR 2.33(3...) −1.4 A1 for 0.93(recurring)

For part (b) the tables shown are:

	1	3			7	3
2		6		7		21
5	5	15		5	35	15

Pearson Edexcel - Friday 10 June 2011 - Paper 4 (Calculator) Higher Tier

6.

7		$\frac{3}{4} \times 120 = 90$ $120 - 90 = 30$ left $30 \div 3$	10	3	M1 for $\frac{3}{4} \times 120$ oe or 90 or $\frac{1}{4} \times 120$ oe or 30 M1(dep) for '30' − (2 × '30' ÷ 3) oe or $\frac{1}{3} \times$ '30' oe A1 cao

Pearson Edexcel - Tuesday 9 November 2010 - Paper 3 (Non-Calculator) Higher Tier

7.

18	(a)	$2\frac{17}{20} - 1\frac{8}{20}$	$1\frac{9}{20}$	3	M1 for dealing with the whole numbers M1 for finding a correct common denominator A1 for $1\frac{9}{20}$ or $\frac{29}{20}$ oe **or** B1 for $\frac{57}{20}$ or $\frac{7}{5}$ oe M1 for finding a correct common denominator A1 for $1\frac{9}{20}$ or $\frac{29}{20}$ oe **or** M1 for 2.85 M1 for 1.4 A1 for 1.45 oe
	(b)	$\frac{8}{3} \times \frac{7}{4} = \frac{8 \times 7}{3 \times 4} = \frac{56}{12}$	$4\frac{2}{3}$	3	B1 for $\frac{8}{3}$ oe or $\frac{7}{4}$ oe M1 for multiplying numerator and denominator of "$\frac{8}{3}$" and "$\frac{7}{4}$" A1 for $4\frac{2}{3}$ oe mixed number or $\frac{14}{3}$ oe **OR** B1 for 2.67 or 2.66(...) and 1.75 M1 (dep B1) for correct method of multiplication A1 for $4\frac{2}{3}$ oe

Pearson Edexcel - Monday 7 June 2010 - Paper 3 (Non-Calculator) Higher Tier

8.

11	$300 \div 6 = 50$ $300 \div 10 \times 3 = 90$ $300 - 90 - 50$ or $\dfrac{1}{6} + \dfrac{3}{10} = \dfrac{7}{15}$ $\dfrac{7}{15} \times 300 = 140$ $300 - 140$	160	4	M1 for $300 \div 6$ or 50 seen M1 for $300 \div 10 \times 3$ oe or $30 + 30 + 30$ or 90 seen M1 (dep on at least 1 previous M1) for $300 - "50" - "90"$ A1 cao or M1 for $\dfrac{1}{6} + \dfrac{3}{10}$ or $\dfrac{7}{15}$ oe M1 for " $\dfrac{7}{15}$ " $\times 300$ or 140 seen or $1 - $ " $\dfrac{7}{15}$ " or $\dfrac{8}{15}$ oe seen M1 (dep on at least 1 previous M1) for $300 - "140"$ or 160 seen or " $\dfrac{8}{15}$ "$\times 300$ A1 cao

Pearson Edexcel - Monday 7 June 2010 - Paper 3 (Non-Calculator) Higher Tier

9.

16	$\dfrac{13}{4} \times \dfrac{8}{3}$	$\dfrac{26}{3}$	3	M1 for attempt to convert to improper fractions eg. $\dfrac{3 \times 4 + 1}{4}$ oe or $\dfrac{2 \times 3 + 2}{3}$ oe seen M1 (dep) for $\dfrac{"13" \times "8"}{4 \times 3}$ or $\dfrac{104}{12}$ oe seen A1 for $\dfrac{26}{3}$ or $8\dfrac{2}{3}$ **OR** M1 for 3.25×2.66 or better M1 for a fully correct multiplication method A1 for 8.66…. (recurring)

Pearson Edexcel - Thursday 5 November 2009 - Paper 3 (Non-Calculator) Higher Tier

10.

7	(a)	$\dfrac{3}{8} + \dfrac{1}{4} = \dfrac{3}{8} + \dfrac{2}{8} =$ Or <table><tr><td></td><td>1</td><td>4</td></tr><tr><td>3</td><td>XXXX</td><td>12</td></tr><tr><td>8</td><td>8</td><td>32</td></tr></table> $8 + 12 = 20$	$\dfrac{5}{8}$	2	M1 Use of common denominator: $\dfrac{1}{4}$ as $\dfrac{2 \times 1}{2 \times 4}$ or writing both fractions with a common denominator other than 8 with at least one of the fractions correct. OR $0.375 + 0.25$ A1 $\dfrac{5}{8}$ Accept 0.625 only Or M1 for sight of the addition table and $8 + 12$ $(= 20)$ A1 $\dfrac{5}{8}$
	(b)	$\dfrac{2}{3} \times \dfrac{4}{5} = \dfrac{2 \times 4}{3 \times 5} = \dfrac{8}{15}$	$\dfrac{8}{15}$	2	M1 for multiplying numerator and denominator of $\dfrac{2}{3}$ and $\dfrac{4}{5}$ OR $0.66(..)\times 0.8$ OR 0.67×0.8 oe A1 for $\dfrac{8}{15}$ oe OR for 0.533..

| 7 | (c) | $\begin{array}{cc} 423 & 12 \\ \times 12 & \times 423 \\ \hline 4230 & 4800 \\ \underline{846} & 240 \\ 5076 & \underline{36} \\ & 5076 \end{array}$ 400 20   3
4000 200 30 10
800   40   6   2

4000+200+30+800+40+6=5076 | 5076 | 3 | M1 for a complete method with relative place value correct. Condone 1 multiplication error, addition not necessary.
M1 (dep) for addition of all the appropriate elements of the calculation
A1 cao

M1 for a complete grid with not more than 1 multiplication error, addition not necessary.
M1 (dep) for addition of all the appropriate elements of the calculation
A1 cao

M1 for sight of a complete partitioning method, condone 1 multiplication error, addition not necessary.
M1 (dep) for addition of the all the appropriate elements of the calculation
A1 cao

M2 for repeated addition, exactly 12
A1 cao |

OCR GSCE – Thursday 5 November 2020 – Paper 5 (Non-Calculator) Higher Tier

11.

| 5 | | | 5.6[0] with correct working | 6 | M2 for $\left(\frac{1}{3}+\frac{2}{5}\right)\times 10$ **oe**

or **M1** for $\frac{1}{3}\times 10$ or $\frac{2}{5}\times 10$

A1 for $\frac{110}{15}$ **oe**
or

M1 for $\frac{1}{3}+\frac{2}{5}$ **oe**

A1 for $\frac{11}{15}$ **oe**

AND

M1dep for *their* improper fraction/decimal/mixed number rounded up to next integer

M1 for *their* integer multiplied by 70 or 0.7

If 0 scored,
SC1 for answer 5.6[0] or 5.6 | "Correct working" requires full evidence of M1A1 AND M1 or convincing pictoral/alternate convincing approach
For method accept equivalent decimals or percentages (to 2 sf)
M2 could be split into $\frac{1}{3}\times 10+\frac{2}{5}\times 10$

The method may be shown pictorially

For A1 eg 7⅓, accept 4 + 3⅓ oe , 733[..]%
A1 implies M2

The method may be shown pictorially

Implies M1

Dep on their improper fraction ≠ integer
Must show a more accurate value first, could be in two parts eg 4 + 3⅓ then 8

This may be earned by those with wrong working then doing eg 8 x 0.7. Must see a calculation implying an integer × 70 or 0.7, could be in several parts |

OCR GSCE – Monday 9 November 2020 – Paper 6 (Calculator) Higher Tier

12.

| 21 | | | $\dfrac{2x-1}{x+2}$ as final answer | 6 | **M1** for $x^2 - 4 = (x + 2)(x - 2)$ soi in the denominator

 AND
 M3 for all 3 fractions combined with quadratic common denominator and expanded numerator <br> or
 M2 for correct products on numerator of at least 2 equivalent fractions that are consistent with their common denominators <br> or
 M1 for correct product on numerator of 1 fraction that is consistent with an attempted common denominator

 AND
 M1dep for $\dfrac{(2x-1)(x-2)}{(x+2)(x-2)}$ or $\dfrac{(2x-1)(x-2)}{x^2-4}$
 (**dep** on previous **M3** earned) | e.g. $\dfrac{6x}{(x+2)(x-2)}$ seen, or a common denominator of $(x + 2)(x - 2)$ later expanded to $x^2 - 4$

 e.g. $\dfrac{x^2-2x+x^2+x+2x+2-6x}{(x+2)(x-2)}$ soi by $\dfrac{2x^2-5x+2}{(x+2)(x-2)}$

 e.g. $\dfrac{x(x-2)}{(x+2)(x-2)}$ oe and $\dfrac{(x+1)(x+2)}{(x+2)(x-2)}$ oe

 e.g. $\dfrac{x(x-2)}{(x+2)(x-2)}$ oe

 Factorises numerator of combined fraction

 Can earn up to **M1 + M2 + M0** for common denominator used that is not in its lowest terms.

 eg. **M0 + M2** for $\dfrac{x(x-2)(x^2-4)}{(x+2)(x-2)(x^2-4)}$ and $\dfrac{(x+1)(x+2)(x^2-4)}{(x+2)(x-2)(x^2-4)}$

 eg. **M1 + M1** for $\dfrac{x(x-2)(x+2)(x-2)}{(x+2)(x-2)(x+2)(x-2)}$ |

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

13.

| 8 | | | 10 | 5 | **B4** for $\dfrac{120}{11}$ oe

 or for $\dfrac{110}{30}$ oe and $\dfrac{121}{30}$ oe <br> or **B3** for $\dfrac{110}{30}$ oe or $\dfrac{121}{30}$ oe

 OR
 B2 for $\dfrac{11}{30}$ oe

 or **M1** for $\dfrac{1}{6}+\dfrac{1}{5}$

 or for $\dfrac{5}{30}$ and $\dfrac{6}{30}$ seen

 M1 for $4 \div$ *their* $\left(\dfrac{1}{6}+\dfrac{1}{5}\right)$ oe | For B4 accept 10.9… or 3.66 to 3.67 and 4.03…
 For B3 accept 3.66 to 3.67 or 4.03…

 0.366 to 0.367 or 36.6% to 36.7%

 For M1 intention to add the fractions eg use of 0.16 to 0.17 + 0.2 oe percentages

 e.g. $4 \div (0.16$ to $0.17 + 0.2)$ oe
 NB can score B2 M1 or M1M1 |