**PROBABILITY TREES**

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

1.

| | | | | | |
|---|---|---|---|---|---|
| 27 | (a) | $\frac{7}{10}, \frac{4}{9}, \frac{5}{9}, \frac{4}{9}$ | B2 | for all probabilities correct (oe) | |
| | | | (B1 | for 2 or 3 correct) | |
| | (b) | $\frac{15}{90}$ | M1 | for $\frac{3}{10} \times \frac{5}{9}$ oe | |
| | | | A1 | $\frac{15}{90}$ oe | Accept any equivalent fraction, decimal form 0.16(6...) or 0.17 or percentage form 16(.6...)% or 17% |

## Pearson Edexcel - Tuesday 12 June 2018 - Paper 3 (Calculator) Foundation Tier

2.

| | | | | |
|---|---|---|---|---|
| 22 | Probabilities should sum to 1 | C1 | for stating that the probabilities should total 1<br>eg 0.25 should be 0.35 | |
| | 0.35 and 0.65 reversed | C1 | for recognising that the 0.35 and 0.65 in the first branches for the 2nd throw should be reversed<br>eg, "for the second throw, the probability it lands on 4 should be 0.65" | Can be shown on the diagram |

## OCR Thursday 05 November 2020- Morning (Non-Calculator) Foundation Tier

**3.**

| | | | | | | |
|---|---|---|---|---|---|---|
| **22** | | | For Monday, does not rain should be 1 – 0.55 oe<br><br>For Tuesday, 0.25 is incorrectly placed on the does not rain branch oe<br><br>A pair of branches is missing for Tuesday after does not rain on Monday oe | 3 | **B1** for each | After each correct statement isw<br>eg 0.55 + 0.35 does not equal 1<br>Monday not rain should be 0.45<br><br>eg For Tuesday the probabilities are placed the wrong way around<br>0.25 should be on the rain branch<br><br>eg There should be two more branches for Tuesday<br><br>See AG |

## OCR November 09 November 2020- Morning (Calculator) Foundation Tier

**4.**

| | | | | | | |
|---|---|---|---|---|---|---|
| **23** | **a** | | 0.12 oe isw | **2** | **M1** for 0.6 × 0.2 | Ignore attempts to change form once correct answer seen.<br>Accept 12% or $\frac{12}{100}$ or equivalent fraction |
| | **b** | | 0.6 oe isw | 3 | **M2** for 0.4 × 0.3 + 0.6 × 0.8<br>or<br>**M1** for 0.4 × 0.3 or 0.6 × 0.8 | Accept 60% or equivalent fraction<br>Ignore attempts to change form once correct answer seen.<br>0.12 could come from (a) so calculation must be seen for **M2**<br><br>May be implied by 0.48 |

**OCR Tuesday 5 November 2019 – Morning (Calculator) Foundation Tier**

**5.**

| | | | | | | |
|---|---|---|---|---|---|---|
| 23 | a | | 0.12 oe isw | 2 | **M1** for $0.6 \times 0.2$ | Ignore attempts to change form once correct answer seen.<br>Accept 12% or $\frac{12}{100}$ or equivalent fraction |
| | b | | 0.6 oe isw | 3 | **M2** for $0.4 \times 0.3 + 0.6 \times 0.8$<br>or<br>**M1** for $0.4 \times 0.3$ or $0.6 \times 0.8$ | Accept 60% or equivalent fraction<br>Ignore attempts to change form once correct answer seen.<br>0.12 could come from (a) so calculation must be seen for **M2**<br>May be implied by 0.48 |

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

**6.**

| | | | | | | |
|---|---|---|---|---|---|---|
| 15 | (a) | | Correct tree diagram | 2 | B1 for $\frac{1}{3}$ correctly placed on first branch<br>B1 for $\frac{3}{5}$ and $\frac{2}{5}$ correctly placed on both sets of second branches | Accept equivalent fractions and decimals with $\frac{1}{3}$ at least 0.33 |
| | (b) | (i) | $\frac{2}{15}$ oe nfww | 2 | FT *their* (a)<br>**M1** for *their* $\frac{1}{3} \times$ *their* $\frac{2}{5}$ | FT their fractions < 1<br>Ignore attempts to cancel or change to decimal or percentage once correct answer seen<br>Do not accept words or ratios<br>Accept 0.13[3...] or 13[.3...]%<br>If no working seen answer must be correct |
| | | (ii) | $\frac{13}{15}$ oe nfww | 2 | FT *their* (i)<br>**M1** for 1 – *their* $\frac{2}{15}$<br>ALTERNATIVE with each of *their* fractions < 1<br>**M1** for $\frac{2}{3}\times\frac{3}{5}+\frac{2}{3}\times\frac{2}{5}+\frac{1}{3}\times\frac{3}{5}$ or $\frac{2}{3}+\frac{1}{3}\times\frac{3}{5}$ | FT their fractions < 1<br>Do not accept words or ratios<br>Accept 0.86 to 0.87 or 86% to 87%<br>If no working seen answer must be correct<br>Ignore attempts to cancel or change to decimal or percentage once correct answer seen<br>May be implied by $\frac{6}{15}+\frac{4}{15}+\frac{3}{15}$ or $\frac{2}{3}+\frac{3}{15}$ |

**OCR Thursday 6 June 2019 – Morning (Non-Calculator) Foundation Tier**

**7.**

| | | | | | | |
|---|---|---|---|---|---|---|
| 17 | (a) | | $\frac{3}{7}$, $\frac{3}{7}$, $\frac{4}{7}$, $\frac{3}{7}$ correctly placed | 2 | **M1** for 2 or 3 probabilities correctly placed | Accept equivalent fractions, decimals or %'s (3 figures for dec or %) |
| | (b) | | $\frac{16}{49}$ **oe** | 2 | **M1** for $\frac{4}{7}\times\frac{4}{7}$ **oe** | |

**OCR Tuesday 6 November 2018 – Morning (Calculator) Foundation Tier**

**8.**

| | | | | | | |
|---|---|---|---|---|---|---|
| 24 | (a) | | 0.6<br>0.7, 0.3, 0.7, 0.3<br>(White), not white, white, not white | 1<br>1<br>1 | | Alternative answer<br>0.7, 0.3, 0.3, 0.7<br>(White), not white, not white, white |

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

**9.**

| | | | | | | |
|---|---|---|---|---|---|---|
| **21** | **a** | **i** | Correct probabilities filled | **1** | First Throw $\frac{5}{6}$, Second Throw $\frac{1}{6},\frac{5}{6},\frac{1}{6},\frac{5}{6}$ | Accept equivalent fractions |
| | | **ii** | $\frac{1}{36}$ **oe** | **2** | **M1** for $\frac{1}{6}\times \textit{their}\ \frac{1}{6}$ | FT *their* tree diagram |
| | **b** | | $\frac{5}{6}\times\frac{5}{6}$<br><br>$\frac{5}{6}\times\frac{5}{6}\times\frac{1}{6}=\frac{25}{216}$ | **M1**<br><br>**A1** | If 0 scored **SC1** for $\textit{their}\ \frac{5}{6}\times\textit{their}\ \frac{5}{6}\times\frac{1}{6}$ | M1 may be implied by a product of three fractions where two of them are $\frac{5}{6}$<br><br>For A1 product must be in this order<br><br>FT *their* tree diagram bottom branch |

**Pearson Edexcel –Sample Papers - Paper 2 (Calculator) Foundation Tier**

10.

| | | | | |
|---|---|---|---|---|
| 29 | | 0.06 | M1 for 0.2 and 0.3<br>A1 cao | |

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

11.

| | | | | | | |
|---|---|---|---|---|---|---|
| **19** | **(a)** | | 0.7<br>0.8 , 0.2, 0.8, 0.2 | **1**<br>**1** | | |
| | **(b)** | | 0.76 with a complete correct method | **2** | **M1** for one correct product from *their* probabilities | e.g 1 – 0.24 = 0.76 or 0.06 + 0.56 + 0.14 = 0.76<br>Marks may be awarded for work on the diagram |

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

12.

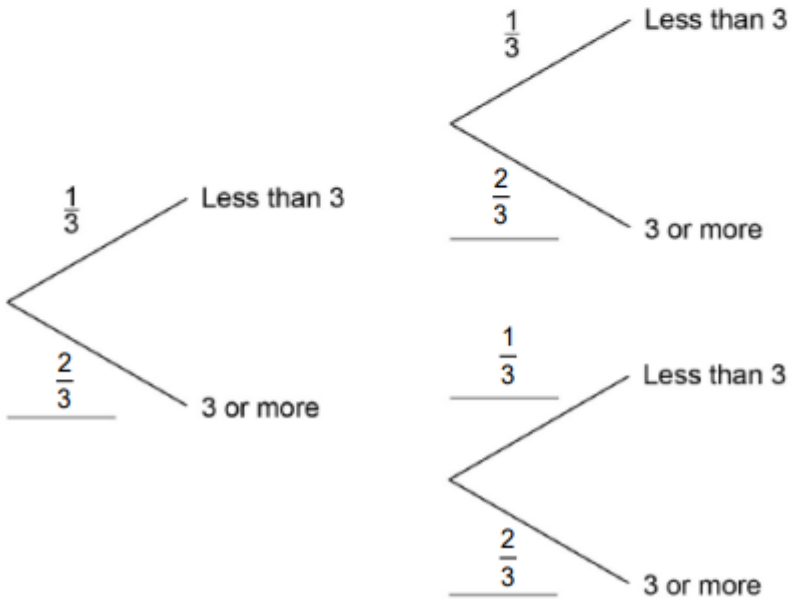
<table>
<tr><td rowspan="7">21(a)</td><td>$\frac{1}{6}$ on '1' and $\frac{1}{3}$ or $\frac{2}{6}$ on '2 or 3'<br>and<br>$\frac{1}{2}$ on each of 'Odd' and 'Even'</td><td>B2</td><td>oe fraction, decimal or percentage<br>B1<br>$\frac{1}{6}$ on '1' and $\frac{1}{3}$ or $\frac{2}{6}$ on '2 or 3'<br>or<br>$\frac{1}{2}$ on each of 'Odd' and 'Even'<br>or<br>all correct unsimplified probabilities with one or more simplification errors<br>eg $\frac{3}{6}$ on 'Odd' simplified to $\frac{1}{3}$</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2">Accept decimals or percentages rounded or truncated correctly to at least 2 significant figures</td><td></td></tr>
<tr><td colspan="2">Only withhold a mark for simplification errors if B2 would otherwise be awarded</td><td></td></tr>
<tr><td colspan="2">Ignore extra branches added</td><td></td></tr>
<tr><td colspan="2">Ignore attempts to work out combined probabilities to the right of the tree diagram</td><td></td></tr>
<tr><td colspan="2">If an answer line is blank, the student may have written their answer elsewhere on the branch</td><td></td></tr>
</table>

| | | | |
|---|---|---|---|
| **21(b)** | **Alternative method 1: P(1) + P(4, 5 or 6) × P(Odd)** | | |
| | $\frac{1}{2}$ × their $\frac{1}{2}$ or $\frac{1}{4}$ | M1 | oe |
| | their $\frac{1}{4}$ + their $\frac{1}{6}$ | M1dep | oe |
| | (P(win) =) $\frac{10}{24}$ or $\frac{5}{12}$ | A1ft | oe ft their tree diagram |
| | Lose (and P(Lose) = $\frac{14}{24}$ or $\frac{7}{12}$ oe) | A1ft | ft correct decision for their $\frac{5}{12}$ (and their $\frac{7}{12}$) with M2 scored |
| | **Alternative method 2: 1 – P(2 or 3) – P(4, 5 or 6) × P(Even)** | | |
| | $\frac{1}{2}$ × their $\frac{1}{2}$ or $\frac{1}{4}$ | M1 | oe |
| | their $\frac{1}{4}$ + their $\frac{1}{3}$<br>or P(lose) = $\frac{7}{12}$ | M1dep | oe<br>ft their tree diagram |
| | (P(win) =) $\frac{10}{24}$ or $\frac{5}{12}$ | A1ft | oe ft their tree diagram |
| | Lose (and P(Lose) = $\frac{14}{24}$ or $\frac{7}{12}$ oe) | A1ft | ft correct decision for their $\frac{5}{12}$ (and their $\frac{7}{12}$) with M2 scored |
| | **Additional Guidance is on the following page** | | |

| | Additional Guidance | |
|---|---|---|
| **21(b) cont** | Check the tree diagram for working | |
| | Any 'their' or ft probability must be > 0 and < 1 for marks to be awarded | |
| | For the second A1ft, the ft can be from an incorrect tree (which may score 4 marks) or an arithmetic error (which scores 3 marks, M1M1A0A1ft) | |
| | Accept equivalent fractions or decimals within calculations and equivalent fractions, decimals or percentages for final probabilities | |
| | Accept decimals or percentages rounded or truncated correctly to at least 2 significant figures | |
| | Condone $\frac{1}{2} \times$ their $\frac{1}{2}$ as part of a longer, incorrect multiplication<br>eg $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{6}$ | M1M0A0A0 |
| | Condone decimals used within fractions<br>eg P(Win) = $\frac{2.5}{6}$ | at least M1M1A1 |
| | For the method marks, condone incorrect mathematical notation<br>eg $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4} + \frac{1}{6} = \ldots$ | at least M1M1 (may go on to score 3 or 4 marks) |
| | For the second A1ft, if the student gives a value for P(Lose), their P(Win) + their P(Lose) must equal 1<br>However, allow a comparison to $\frac{1}{2}$ unless it is clearly an incorrect value for P(Lose) | |

**AQA Thursday 7 June 2018 – Morning (Calculator) Foundation Tier**

13.

| | | | |
|---|---|---|---|
| **22(a)** | $\frac{1}{3}$ or $\frac{2}{6}$ or 0.33… or 33.(…)% on each top branch<br>and<br>$\frac{2}{3}$ or $\frac{4}{6}$ or 0.66… or 0.67 or 66.(…)% or 67% on each bottom branch | B1 | accept any equivalent fraction, decimal or percentage |
| | **Additional Guidance** | | |
| | Decimals must have at least 2 decimal places so do not accept 0.3 or 0.6 or 0.7 | | |
| | Only accept the percentages shown, do not accept 30% or 60% | | |
| | Ignore working around the edge of the diagram | | |
| |  | | B1 |

| | | | |
|---|---|---|---|
| **22(b)** | $\frac{1}{9}$ or 0.11… or 11.(…)% | B1 | |
| | **Additional Guidance** | | |
| | Ignore probability words such as 'unlikely' or 'evens' | | |

| | | |
|---|---|---|
| | Accept equivalent answers eg $\frac{2}{18}$, $\frac{3}{27}$, $0.\dot{1}$ | |
| | Do not accept 0.1 or 10% | |