

1. (a) (i) 0.23 (A1) (C1)
(ii) $0.21 + 0.15 = 0.36$ (A1) (C1)

Note: Accept equivalent answers

- (b) 1200×0.23 (M1)
 $= 276$ (A1) (C2)

Note: Follow through from candidate's answer in part (a)(i)

[4]

2. (a) $\frac{3}{50}$ or 6% or 0.06 (A1) (C1)

- (b) $\frac{45}{50}$ or $\frac{9}{10}$ or 90% or 0.9 (A1) (C1)

- (c) $\frac{16}{18}$ or $\frac{8}{9}$ or 0.889 (3 s.f.) (A2) (C2)

Note: Award (A1) for 16 and (A1) for 18

[4]

3. (a) $\frac{4}{9}$ (A2)

- (b) $\frac{2}{9}$ (A2)

[4]

4. (a) Rugby: sector angle = $\frac{38}{180} \times 360^\circ$ (M1)
 $= 76^\circ$ (A1)

- (b) $p(\text{Hockey}) = \frac{43}{180}$ or 0.239 (3 s.f.) (A2)

[4]

5. (a) $\frac{40 \times 6}{360} = \frac{240}{360}$ or $\frac{2}{3}$ or 0.667 (3 s.f.) (A1)

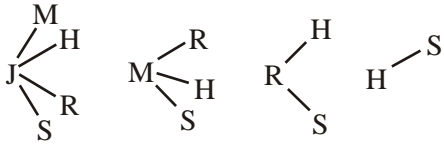
- (b) $\frac{2 \times 20}{360} = \frac{40}{360}$ or $\frac{1}{9}$ or 0.111 (3 s.f.) (A1)

- (c) $\frac{3 \times 20}{120} = \frac{60}{120}$ or $\frac{1}{2}$ or 0.5 (A1)

- (d) $\frac{100}{360} = \frac{5}{18}$ or 0.278 (3 s.f.) (A1)

[4]

6. (a)



(M1)

Note: Award (M1) for any reasonable counting method.

10 combinations

(A1)

(b) $\frac{1}{10}$ (allow follow through from part (a))

(A2)

[4]

7. (a) 0.75×0.82

(M1)

$$= 0.615 \left(\text{accept } 61.5\% \text{ or } \frac{123}{200} \right)$$

(A1)

(b) 0.25×0.18

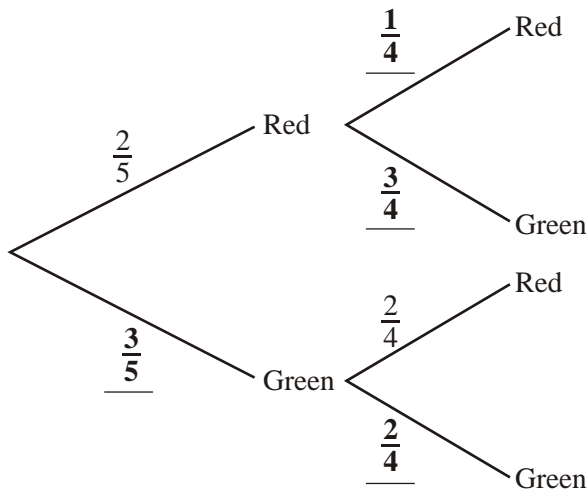
(M1)

$$= 0.045 \left(\text{accept } 4.5\% \text{ or } \frac{9}{200} \right)$$

(A1)

[4]

8.

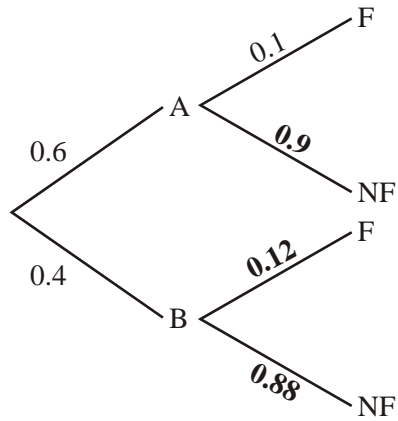


(A4) (C4)

Note: Award (A1) for each correct bold entry

[4]

9. (a)



(A1)

Note: Award (A1) for two or three bold entries correct.

(b) (i) $0.6 \times 0.1 = 0.06$ (A1)

(ii) $0.6 \times 0.9 + 0.4 \times 0.88 = 0.892$ (M1)(A1)

[4]

10. (a) 12 (A2) (C2)

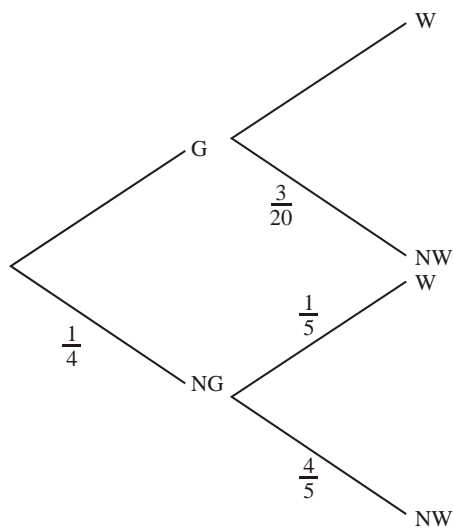
(b) $\frac{3}{12} = \frac{1}{4}$ or 25% (A2) (C2)

(c) $\frac{2}{12} = \frac{1}{6}$ or 16.7% (3 s.f.) (A2) (C2)

(d) $\frac{4}{12} = \frac{1}{3}$ or 33.3% (3 s.f.) (A2) (C2)

[8]

11. **Note:** In the Spanish papers B is used instead of G and P is used instead of W.



(a)

(A4) (C4)

(b) $P(G|W) = \frac{3}{4} \times \frac{17}{20}$ (A1)
 $P(NG|W) = \frac{1}{4} \times \frac{1}{5}$ (A1)
 $P(W) = \frac{3}{4} \times \frac{17}{20} + \frac{1}{4} \times \frac{1}{5}$ (M1)
 $= \frac{11}{16}$ (0.6875, 68.75% or 0.688 to 3 s.f.) (A1) (C4)

[8]

12. (a) $a = 1, b = 3$ (allow $\frac{1}{8}, \frac{3}{8}$) (A1)(A1) (C2)

(b) $P(\text{two fours}) = \frac{3}{8} \times \frac{3}{8}$ (M1)
 $= \frac{9}{64}$ (or 0.141 to 3 s.f.) (A1) (C2)

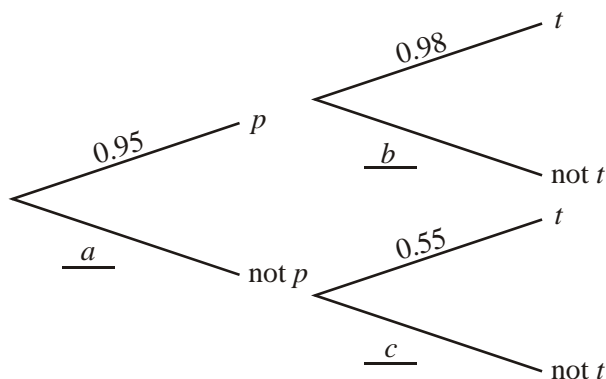
(c) $P(\text{not two or three}) = \frac{6}{8}, \left(\text{or } \frac{3}{4} \text{ or } 0.75\right)$ (A2)

so $P(\text{six not two or three}) = \frac{1}{\frac{8}{6}} = \frac{1}{6}$ (or 0.167) (M1)(A1) (C4)

[8]

13.

(A1)
 $P(W) = \frac{3}{4} \times \frac{17}{20} + \frac{1}{4} \times \frac{1}{5} = \frac{11}{16}$ 13. (a)



$a = 0.05$ (A1)
 $b = 0.02$ (A1)
 $c = 0.45$ (A1) (C3)

(b) $0.95 \times 0.98 = 0.931$ (M1)(A1) (C2)

(c) $0.95 \times 0.02 + 0.05 \times 0.45$ (M1)(M1)
 $= 0.0415$ (A1) (C3)

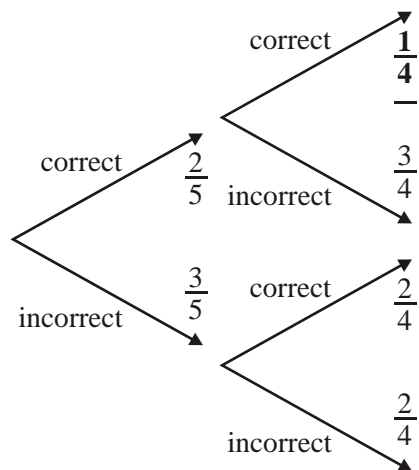
14. (a) 109 (A1) (C1)
 (b) 60–120 thousand dollars (A1) (C1)
 (c) $\frac{32}{109}$ For correct numerator (A1)
 For correct denominator (A1) (C2)
 (d) $\frac{10}{39}$ For correct numerator (A1)
 For correct denominator (A1) (C2)

[6]

15. (a) For solving for $P(A \cap B)$ from the formula in their tables (M1)
 $P(A \cap B) = 0.2$ (A1) (C2)
- (b) Because $0.4 \times 0.65 \neq 0.2$ need to see the numbers, not just a statement (R1)
 Therefore no, not independent (A1) (C2)
Note: Cannot award (A1) if (R1) not awarded
- (c) Because $P(A \cap B) \neq 0$ (R1)
 Not mutually exclusive (A1) (C2)
Note: Cannot award (A1) if (R1) not awarded.

[6]

16. (a)



(A2) (C2)

- (b) (i) $\frac{2}{5} \times \frac{3}{4} + \frac{3}{5} \times \frac{2}{4}$ (A1)(A1)

Note: Award (A1) for each correct product.

$= \frac{12}{20} (= 0.6)$ (A1) (C3)

(ii) $\frac{\frac{2}{5} \times \frac{1}{4}}{\frac{3}{10} + \frac{1}{10}} = \frac{1}{4} = (0.25)$ (A1)(A1)(A1) (C3)

Note: Award (A1) for $\frac{2}{5} \times \frac{1}{4}$ seen and (A1) for $\frac{3}{10} + \frac{1}{10}$ seen.

[8]

17. (a) $\left(\frac{8}{15} \times \frac{7}{14}\right)$ (M1)

$= \frac{56}{210} = \frac{4}{15} (0.267)$ (A1) (C2)

Note: (M1) is for a product including at least one correct fraction.

(b) $\left(\frac{4}{15} \times \frac{3}{14}\right) + \left(\frac{3}{15} \times \frac{2}{14}\right)$ (M1)(M1)

Note: (M1) is for adding two products, the other (M1) is if both products attempt to deal with non-replacement and the numbers are not ridiculous.

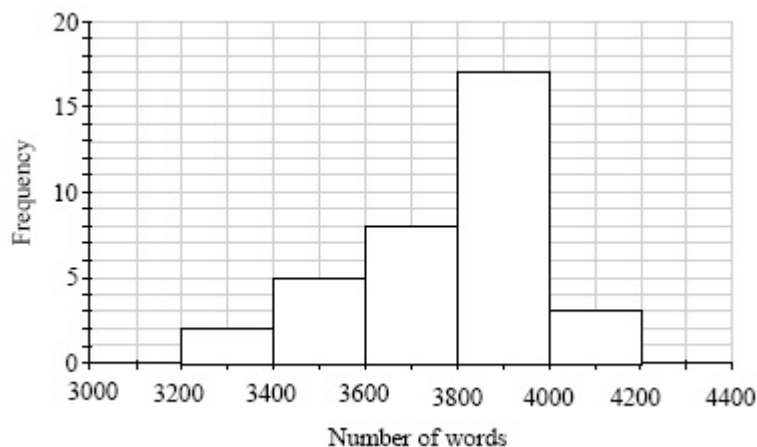
$= \frac{18}{210} \text{ or } \frac{3}{35} (0.0857)$ (A1) (C3)

Note: If one correct product is doubled this receives (M1)(M0)(A0)

(c) The probability is 0. (Allow answer “impossible” or equivalent.) (A1) (C1)

[6]

18. (a)



(A3)

Notes: (A3) for correct histogram, (A2) for one error, (A1) for two errors, (A0) for

more than two errors. Award maximum (A2) if lines do not appear to be drawn with a ruler. Award maximum (A2) if a frequency polygon is drawn. (C3)

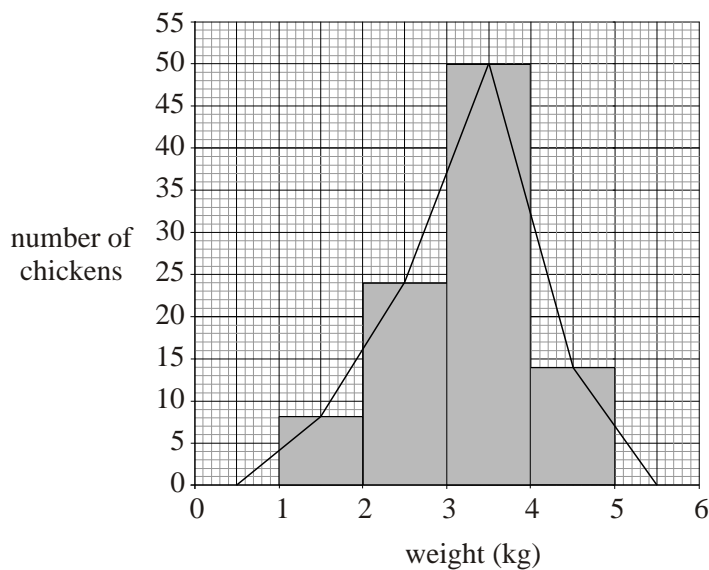
(b) Modal group = 3800 $w < 4000$ (A1) (C1)

(c) Probability = $\frac{3}{35}$ (0.0857, 8.57%) (A1)(A1)

Note: (A1) for correct numerator (A1) for correct denominator. (C2)

[6]

19. Unit penalty (UP) is applicable where indicated.



(a) Dashed or solid line (using a ruler) passing through mid-points of the 4 bars. (A1)

Starting and finishing at $\left(\frac{1}{2}, 0\right)$ and $\left(5\frac{1}{2}, 0\right)$ respectively. (A1) (C2)

(b) 96 (A1) (C1)

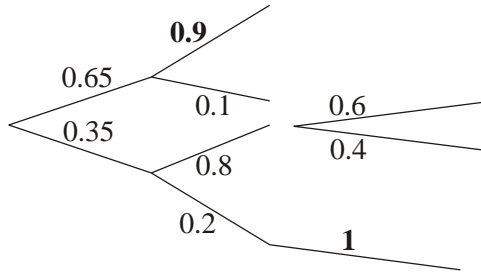
(c) 3 weight < 4 kg. *Accept* 3–4 kg (A1) (C1)

(d) For adding three heights or subtracting 14 from 96 (M1)

$\frac{82}{96}$ (0.854 or $\frac{41}{48}$, 85.4%) (ft) from (b). (A1)(ft) (C2)

[6]

20. (a)



(A1)(A1) (C2)

- (b) 0.65 0.1 (= 0.065)
 0.35 0.8 0.4 (= 0.112)
 0.35 0.2 1 the 1 can be implied (= 0.07)
 0.247

(A1)
 (A1)
 (A1)(ft)
 (A1)(ft) (C4)

Note: No (ft) for any probabilities greater than 1.

[6]