## Assessment Schedule – 2005

## Mathematics: Determine probabilities (90194)

### Evidence Statement

### SCHOOL PROBABILITY

| | Achievement Criteria | Q | Evidence | Code | Judgement | Sufficiency |
|---|---|---|---|---|---|---|
| **Achievement** | Determine probabilities. | 1(a) | $\frac{260}{970}$ or 0.268041 <br> or 260 in 970 or 260 out of 970 or 260:710 | A | Allow equivalent fractions, decimals, percentages or ratio. | **Achievement:** <br> 3 × Code A. |
| | | 1(b) | $\frac{125}{460}$ or $\frac{25}{92}$ or 0.271739 | A | Any rounding / truncating; doesn't need to be stated. | Repeated incorrect use of ratio notation not repeatedly penalised at A – first use is "N" thereafter "con". |
| | | 2(a) | $\frac{1}{25}$ $\quad$ $\frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$ or 0.04 | A | Accept calculator notation for a fraction anywhere (eg 2 ⌐ 3) | |
| | | 2(b) | $\frac{4}{5}$ or $\frac{20}{25}$ or 0.8 | A | | |
| **Achievement with Merit** | Solve probability problems using theoretical methods. | 2(c) | $P(V.V') = \frac{1}{5} \times \frac{4}{5} = \frac{4}{25} = 0.16$ <br><br> $P(V'V) = \frac{4}{5} \times \frac{1}{5} = \frac{4}{25}$ <br><br> $2 \times \frac{1}{5} \times \frac{4}{5} = \frac{8}{25}$ or 0.32 | Either of these = A <br><br><br> M | Allow equivalent fractions, decimals, or percentages. <br><br> Any rounding / truncating | **Achievement with Merit** <br> **EITHER** <br> As for Achievement **plus** <br> 2 × Code M. <br><br> **OR** <br> 3 × Code M. |
| | | 3(a) | 0.45 Feb     0.3 pp <br> 0.55 Mar     0.5 pp <br><br> = 0.135    0.275 <br> (0.45 × 0.3) + (0.55 × 0.5) = 0.41 | A/M | • Feb only, ie 0.135 = "A" (not 0.275 because both branches = unless it is clear that the correct branch is being used) <br> • The 0.45 × 0.3 + 0.55 × 0.5 working, without actual calculation, is "A". | |
| | | 3(b) | = 0.03375    = 0.165 <br> (0.45 × 0.3 × 0.25) + (0.55 × 0.5 × 0.6) <br><br> = 0.19875 | A/M | • 0.03375 or 0.165 = "A" <br> • 0.45 × 0.3 × 0.25 + 0.55 × 0.5 × 0.6 working, without actual calculation, is "A". <br><br> Consistent with part (a) | |

| | Achievement Criteria | Q | Evidence | Code | Judgement | Sufficiency |
|---|---|---|---|---|---|---|
| **Achievement with Excellence** | Explore probability situations to solve problems. | 4 | **Choose an appropriate tool** and briefly describe how to use it: eg use calculator rand# generator to produce 5 digits. **Assign outcomes**: eg 0 = V, 1 = I, 2 = D, 3 = E, 4 = O **Define one trial**: eg produce digits and note outcomes until a complete set is obtained. **Record data**: eg number of "cards" needed to get one complete set. **Repeat** eg 30 times. **Answer the question:** eg average the 30 results, to give an estimate of how many items need to be bought on average, to obtain a free video rental. | E | Accept 5-sided dice, 5 cards, 5 counters / beads, etc. Example of the minimum information (stated or clearly implied) required: "Count the number of rolls of a die needed, to get at least 1 each of 1– 5. This represents one set of the cards (ie it is one trial)". Average the numbers of rolls obtained from several trials (ie clearly not an average of the dice / card values); mean, median and mode are all acceptable averages. | Achievement with Excellence: As for Merit plus code E. |

## Judgement Statement

| Achievement | Achievement with Merit | Achievement with Excellence |
|---|---|---|
| Determine probabilities. | Solve probability problems using theoretical methods. | Explore probability situations to solve problems. |
| 3 × A | **Achievement** *plus* 2 × M *or* 3 × M | **Merit** *plus* 1 × E |