

Geometry · Probability: Independence, Conditional Probability and Fair Decisions · Test Answer Key

Common Core S-CP.A.1, S-CP.A.2, S-CP.A.3, S-CP.A.4, S-CP.A.5, S-CP.B.6, S-CP.B.7, S-CP.B.8, S-CP.B.9, S-MD.B.6, S-MD.B.7 · mathovore.fr

This answer key shows the worked solution and the scoring guide for every question of the probability test. Award the points as described, give partial credit for correct setups, and total the score out of 20.

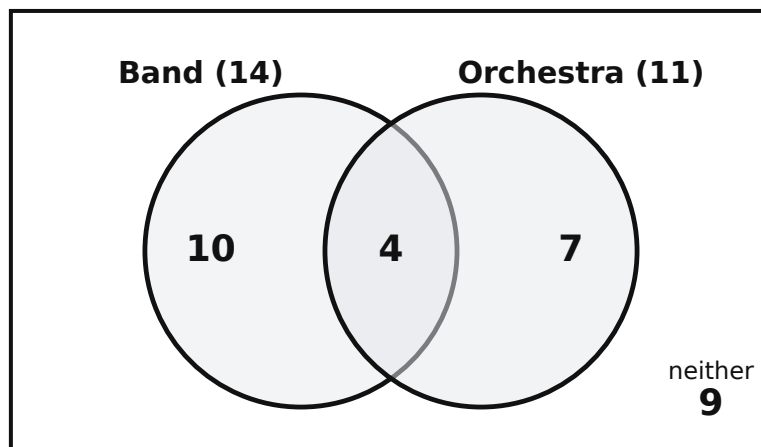
GeometryCommon Core: S-CP.A.1 · S-CP.A.2 · S-CP.A.3 · S-CP.A.4 · S-CP.A.5 · S-CP.B.6 · S-CP.B.7 · S-CP.B.8 · S-CP.B.9 · S-MD.B.6 · S-MD.B.7

Question 1: Two clubs on a Venn diagram (2 points)

(a) Band or orchestra: $14+11-4=21$. Neither: $30-21=9$.

(b) $\frac{21}{30} = \frac{7}{10}$.

Scoring: 1 point for 9 (accept 9 from a correct diagram); 1 point for $\frac{7}{10}$ or 0.7.



Completed diagram.

Question 2: Independence and the addition rule (2 points)

(a) $0.35 \times 0.6 = 0.21 = P(A \text{ and } B)$, so A and B are independent.

(b) $0.35 + 0.6 - 0.21 = 0.74$.

Scoring: 1 point for comparing the product with $P(A \text{ and } B)$ and concluding independent; 1 point for 0.74.

Question 3: Honey sales and age (3 points)

(a) $\frac{36}{100} = \frac{9}{25}$.

(b) $\frac{54}{90} = \frac{3}{5}$.

(c) $P(\text{honey}) = \frac{90}{200} = 0.45 \neq 0.36 = P(\text{honey} | \text{under } 30)$, so not independent.

Scoring: 1 point per part; in (a) and (b) the correct denominator (100, then 90) earns the point, and (c) needs a numerical comparison.

Question 4: Two jellybeans (2 points)

(a) $\frac{6}{10} \cdot \frac{5}{9} = \frac{30}{90} = \frac{1}{3}$.

(b) Red then yellow: $\frac{6}{10} \cdot \frac{4}{9} = \frac{24}{90}$; yellow then red is equal. Total $\frac{48}{90} = \frac{8}{15}$.

Scoring: 1 point for each part; in (b) the point requires both orders.

Question 5: Swim meet counting (2 points)

(a) ${}_9P_3 = 9 \cdot 8 \cdot 7 = 504$.

(b) ${}_9C_3 = \frac{504}{6} = 84$.

Scoring: 1 point per part.

Question 6: Choosing three students (3 points)

(a) $\frac{{}_8C_3}{{}_{14}C_3} = \frac{56}{364} = \frac{2}{13}$.

(b) Complement: $1 - \frac{2}{13} = \frac{11}{13}$.

Scoring: (a) 1 point for 56 and 364, 1 point for $\frac{2}{13}$; (b) 1 point for using the complement.

Question 7: Choosing with a spinner (2 points)

(a) Primes: 2, 3, 5, 7, so $P(\text{Mei}) = \frac{4}{8} = \frac{1}{2}$. Fair.

(b) Results 6, 7, 8: $P(\text{Mei}) = \frac{3}{8}$ and $P(\text{Noah}) = \frac{5}{8}$. Not fair.

Scoring: 1 point per part, with the probabilities shown.

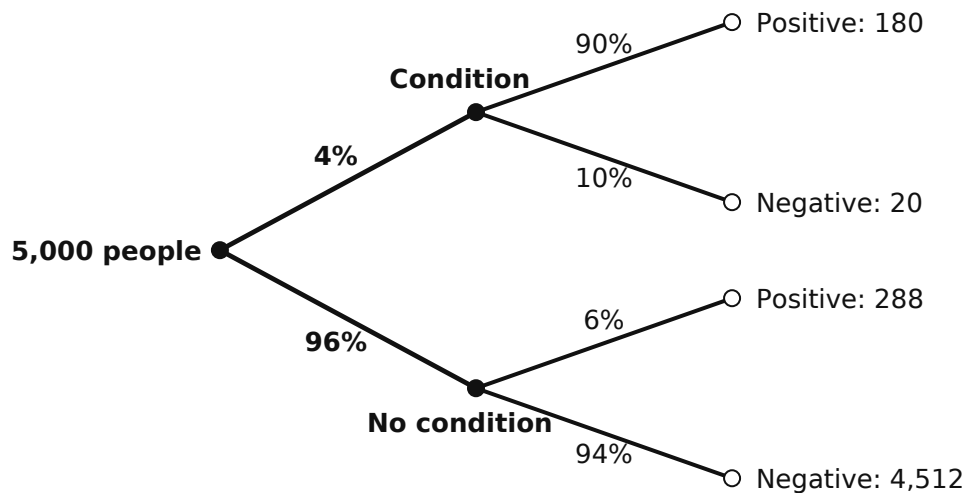
Question 8: Screening test (3 points)

(a) Condition: $5000 \times 0.04 = 200$ people, $0.9 \times 200 = 180$ positive. No condition: 4800 people, $0.06 \times 4800 = 288$ positive.

(b) $\frac{180+288}{5000} = \frac{468}{5000} = 0.0936$.

(c) $\frac{180}{468} = \frac{5}{13} \approx 0.385$.

Scoring: 1 point per part.



Completed tree.

Question 9: Switching doors (1 point)

The first pick is correct with probability $\frac{1}{3}$. Switching wins exactly when the first pick was wrong, so $\frac{2}{3}$.

Scoring: 1 point for $\frac{2}{3}$ with a reason; 0 points for an answer with no reason.

Total
20 points