

Grade 7 · Probability of Compound Events · Test Answer Key

Common Core 7.SP.C.8 · mathovore.fr

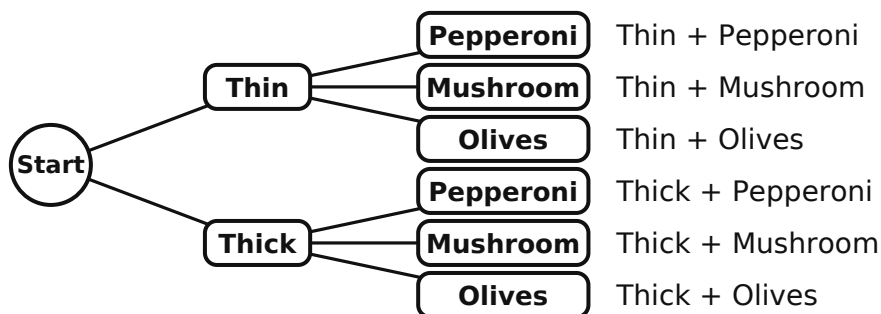
Use this answer key to score the compound events test. Each solution shows the sample space, the favorable outcomes and the simplified probability, followed by a scoring guide that explains how the points are awarded. Give partial credit when the sample space is right but the final fraction is not simplified.

Grade 7 Common Core: 7.SP.C.8

Question 1: Pizza orders (2 points)

- a. Thin + pepperoni, thin + mushroom, thin + olives, thick + pepperoni, thick + mushroom, thick + olives: 6 pizzas.
- b. Two pizzas have mushroom: $\frac{2}{6} = \frac{1}{3}$.

Answer: $\frac{1}{3}$.



The six paths are the sample space.

Scoring: 1 point for a complete list of 6 outcomes with no repeats; 1 point for $\frac{2}{6}$ simplified to $\frac{1}{3}$.

Question 2: Coin and number cube (2 points)

- a. $2 \times 6 = 12$ outcomes.
- b. The primes on the cube are 2, 3 and 5, so T2, T3 and T5 are favorable: $\frac{3}{12} = \frac{1}{4}$.

Answers: 12; $\frac{1}{4}$.

Scoring: 1 point for 12; 1 point for identifying three favorable outcomes and the simplified fraction.

Question 3: Table of sums (2 points)

- a. See the completed table.
 b. Sums of 6, 7 or 8 occur $3 + 2 + 1 = 6$ times out of 16: $\frac{6}{16} = \frac{3}{8}$.

Answer: $\frac{3}{8}$.

Cube 2				
Cube 1	1	2	3	4
1	2	3	4	5
2	3	4	5	6
3	4	5	6	7
4	5	6	7	8

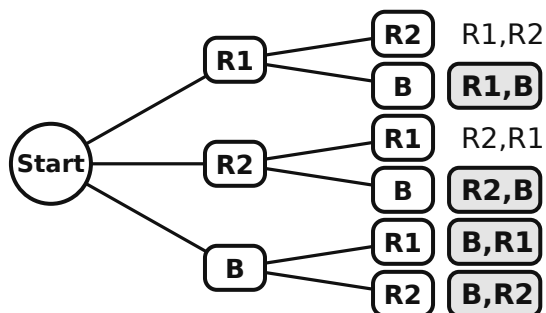
Highlighted cells have a sum greater than 5.

Scoring: 1 point for a table with all 16 sums correct; 1 point for $\frac{6}{16}$ simplified to $\frac{3}{8}$.

Question 4: Draw without replacement (2 points)

- a. R1R2, R1B, R2R1, R2B, BR1, BR2 (6 outcomes).
 b. Exactly one red: R1B, R2B, BR1, BR2, so $\frac{4}{6} = \frac{2}{3}$.

Answer: $\frac{2}{3}$.



The four highlighted outcomes have exactly one red marble.

Scoring: 1 point for all 6 ordered pairs; 1 point for $\frac{4}{6} = \frac{2}{3}$.

Question 5: Sums of two number cubes (3 points)

- a. Sum 8 appears 5 times: $\frac{5}{36}$.
 b. Sums 2, 3 and 4 appear $1 + 2 + 3 = 6$ times: $\frac{6}{36} = \frac{1}{6}$.
 c. Sum 5 appears 4 times and sum 10 appears 3 times: $\frac{7}{36}$.

Answers: $\frac{5}{36}$, $\frac{1}{6}$, $\frac{7}{36}$.

Scoring: 1 point for each part: counting the favorable cells correctly and writing the fraction over 36.

Question 6: Predict from probability (2 points)

- a. The sample space has $3 \times 2 = 6$ outcomes and only 3H is favorable: $\frac{1}{6}$.
- b. $\frac{1}{6} \times 120 = 20$.

Answers: $\frac{1}{6}$; 20 times.

Scoring: 1 point for $\frac{1}{6}$; 1 point for 20.

Question 7: Simulate three children (3 points)

- a. The ten digits 0 to 9 include five even (0, 2, 4, 6, 8) and five odd digits, so each child is a girl with probability $\frac{1}{2}$.
- b. Only 482 and 246 have all digits even: $\frac{2}{12} = \frac{1}{6}$.
- c. GGG, GGB, GBG, GBB, BGG, BGB, BBG, BBB is 8 outcomes and only GGG is favorable: $\frac{1}{8}$.

Answers: equal chance; $\frac{1}{6}$; $\frac{1}{8}$.

1: 482	2: 175	3: 360	4: 246	5: 913	6: 508
7: 625	8: 731	9: 874	10: 459	11: 063	12: 297

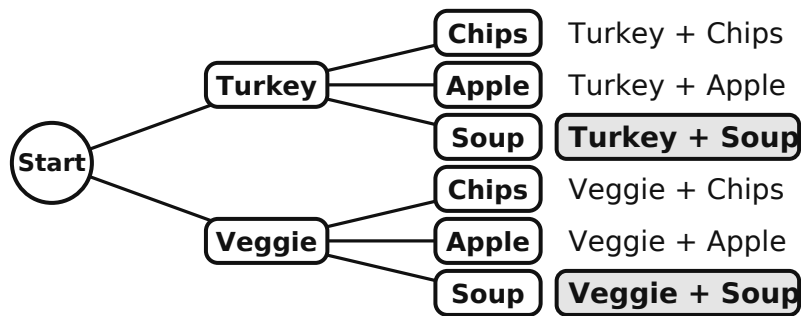
Two of the twelve trials show three girls.

Scoring: 1 point for noting 5 even and 5 odd digits; 1 point for $\frac{2}{12} = \frac{1}{6}$; 1 point for the 8-outcome sample space and $\frac{1}{8}$.

Question 8: Lunch tree diagram (2 points)

- a. Two of the six paths end in soup: $\frac{2}{6} = \frac{1}{3}$.
- b. One path is Veggie + Apple: $\frac{1}{6}$.

Answers: $\frac{1}{3}$; $\frac{1}{6}$.



The highlighted paths end in soup.

Scoring: 1 point for each correct simplified probability.

Question 9: Design a simulation (2 points)

Let 1 and 2 mean a hit ($\frac{1}{3}$) and 3, 4, 5, 6 mean no hit. One trial is two rolls of the cube, one for each at-bat. Do many trials, for example 50, and count the trials with at least one roll of 1 or 2. The estimate is that count divided by the number of trials.

Scoring: 1 point for a correct model of one at-bat (two numbers of six for a hit); 1 point for a trial of two rolls, many trials and counting trials with at least one hit.

Total
20 points