

Precalculus · Expected Value and Decisions · Test Answer Key

Common Core S-MD.A.3, S-MD.A.4, S-MD.B.5 · mathovore.fr

This precalculus expected value test answer key gives the full solution and the scoring guide for each of the 8 test questions on expected value and decisions.

The answer key gives a complete solution for each question with a scoring guide. Award the stated points for correct setup, correct arithmetic, and a clear conclusion in context. Accept equivalent fractions and decimals. Total: 20 points.

Precalculus Common Core: S-MD.A.3 · S-MD.A.4 · S-MD.B.5

Precalculus Expected Value Test Answer Key: questions 1-5

Question 1: Distribution check (2 points)

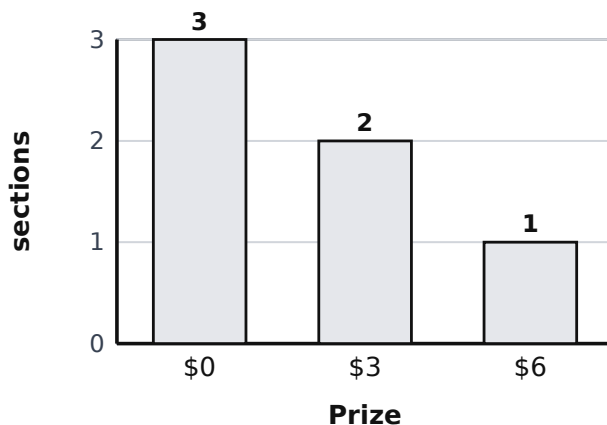
- a. $k = 1 - 0.15 - 0.35 - 0.20 = 0.30$.
b. $P(X \geq 2) = 0.35 + 0.20 = 0.55$.

Scoring: 1 point for $k = 0.30$ (sum of probabilities equals 1); 1 point for 0.55.

Question 2: Carnival spinner (2 points)

- a. $P(0) = \frac{3}{6} = \frac{1}{2}$, $P(3) = \frac{2}{6} = \frac{1}{3}$, $P(6) = \frac{1}{6}$.
b. $E = 0\left(\frac{1}{2}\right) + 3\left(\frac{1}{3}\right) + 6\left(\frac{1}{6}\right) = 0 + 1 + 1 = 2$. The expected prize is \$2.

Scoring: 1 point for the three correct probabilities; 1 point for the sum of products and the answer 2.

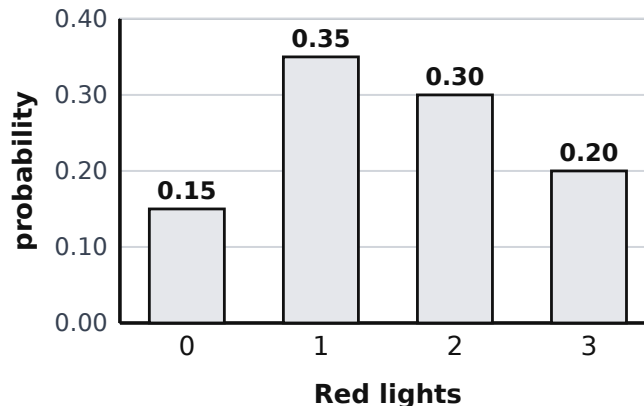


Number of sections for each prize.

Question 3: Red lights on the way to school (3 points)

- a. $P(0) = \frac{12}{80} = 0.15$, $P(1) = \frac{28}{80} = 0.35$, $P(2) = \frac{24}{80} = 0.30$, $P(3) = \frac{16}{80} = 0.20$.
b. $E = 0(0.15) + 1(0.35) + 2(0.30) + 3(0.20) = 0.35 + 0.60 + 0.60 = 1.55$.
c. $200 \times 1.55 = 310$ red lights.

Scoring: 1 point per part.



The empirical distribution from part (a).

Question 4: Card game at the fair (3 points)

- a. $E = 12\left(\frac{1}{10}\right) + 3\left(\frac{3}{10}\right) + 0\left(\frac{6}{10}\right) = 1.2 + 0.9 = 2.1$. The expected payout is \$2.10.
b. $2.10 - 2 = 0.10$. The expected net result is +\$0.10.
c. Not fair, because the expected net result is not 0. It favors the player by \$0.10 per game. The fair price is \$2.10.

Scoring: 1 point per part.

Question 5: Phone insurance (3 points)

- a. $0.06(450) = 27$. The expected loss is \$27.
b. No. The insurance costs \$35, which is \$8 more than the expected loss.
c. $p(450) = 35$ gives $p = \frac{35}{450} \approx 0.0778$, which is about 7.8%.

Scoring: 1 point per part.

Precalculus Expected Value Test Answer Key: questions 6-8

Question 6: Two penalty kicks (3 points)

- a. $P(0) = 0.4 \times 0.4 = 0.16$; $P(1) = 2(0.6)(0.4) = 0.48$; $P(2) = 0.6 \times 0.6 = 0.36$. The total is 1.
b. $E = 0(0.16) + 1(0.48) + 2(0.36) = 0.48 + 0.72 = 1.2$ goals.

Scoring: part (a) 1 point for finding the end probabilities, 1 point for combining the two ways to

get one goal; part (b) 1 point.

Question 7: TV warranty (2 points)

- a. $0.10(350) = 35$. The expected repair cost is \$35.
- b. The warranty costs \$80, which is \$45 more than the expected repair cost, so it is not worth buying by expected value.

Scoring: 1 point per part.

Question 8: Entry fee for a game (2 points)

- a. $E = 8(0.25) + 3(0.5) + 0(0.25) = 2 + 1.5 = 3.5$. The expected payout is \$3.50.
- b. Per game: $3.5 - 4 = -0.5$. For 100 games: $100(-0.5) = -50$. A loss of about \$50.

Scoring: 1 point per part.

Scoring summary

Total
20 points: add the points of every question of this precalculus expected value test answer key.

How to use this precalculus expected value test answer key

Use this precalculus expected value test answer key to score the test fairly and to see which skills need more practice.

