



H03-test Risk (Higher): Test Pack

EDEXCEL 1ST0 · Calculator allowed · about 20 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A car parts factory states that the risk of a particular sensor failing during its warranty period is 1 in 40.
- (a) Write the risk of 1 in 40 as a fraction. (1)
- _____
- (b) Write the risk of 1 in 40 as a decimal. (1)
- _____
- (c) Write the risk of 1 in 40 as a percentage. (1)
- _____
- (d) The factory sells 6000 of these sensors during the warranty period. Work out the number of sensors expected to fail. (2)
- _____

(Total for Question 1 is 5 marks)

- 2** Which of these is equivalent to a risk of 1 in 8?

- ☐ A) 8%
- ☐ B) 12.5%
- ☐ C) 1.8%
- ☐ D) 80%

(Total for Question 2 is 1 mark)

3 For each statement about risk, odds and independent events, write down whether it is True or False.

- (i) A risk of 1 in 500 is smaller than a risk of 1 in 25. (1)
- (ii) Odds of 1 : 4 against an event happening mean the same thing as a probability of $\frac{1}{4}$ for that event. (1)
- (iii) If two risks are independent, the probability that both events happen is found by multiplying their individual probabilities together. (1)

(Total for Question 3 is 3 marks)

4 The probability that a delivery van is delayed on a particular route is 0.2.

- (a) Write this probability as odds against the van being delayed, giving your answer in the form $n : 1$. (2)
- (b) A different component in a factory has odds against failure during a shift of 7 to 3. Work out the probability that this component fails during a shift. (2)
- (c) Explain why odds and probability are not exactly the same way of measuring how likely an event is. (1)

(Total for Question 4 is 5 marks)

5 A security system has two independent alarm components. Component X has an annual risk of failing to activate of 5%. Component Y has an annual risk of failing to activate of 2%.

(a) Work out the probability that both components fail to activate in a year. (2)

.....
(b) Work out the probability that neither component fails (that is, the system definitely works as intended). (2)

.....
(c) Explain why it is valid to multiply the two individual probabilities together in part a. (1)

(Total for Question 5 is 5 marks)

Mark scheme · H03-test Risk (Higher): Test Pack

Question 1

- (a) **B1** $\frac{1}{40}$ cao
- (a) **Answer: $\frac{1}{40}$**
- (b) **B1** 0.025 cao
- (b) **Answer: 0.025**
- (c) **B1** 2.5% cao
- (c) **Answer: 2.5%**
- (d) **M1** 6000 divided by 40, oe
- (d) **A1** 150 cao
- (d) **Answer: 150**

Question 2

- **B1** B cao
- **Answer: B) 12.5%**

Question 3

- (i) **B1** True cao
- (i) **Answer: True**
- (ii) **B1** False cao
- (ii) **Answer: False**
- (iii) **B1** True cao
- (iii) **Answer: True**

Question 4

- (a) **M1** $0.8 : 0.2$, oe
- (a) **A1** 4 : 1 cao
- (a) **Answer: 4 : 1**
- (b) **M1** 3 divided by (7 + 3), oe
- (b) **A1** 0.3 or 30% cao
- (b) **Answer: 0.3 (30%)**
- (c) **B1** valid explanation, e.g. probability compares the number of successful outcomes to ALL possible outcomes, whereas odds compare the successful outcomes only to the unsuccessful outcomes, oe
- (c) **Answer: Probability compares successful outcomes to all outcomes; odds compare successful outcomes to unsuccessful outcomes only, so the two numbers are calculated differently even though both describe likelihood.**

Question 5

- (a) **M1** 0.05×0.02 , oe
- (a) **A1** 0.1% or 0.001 cao
- (a) **Answer: 0.1%**
- (b) **M1** 0.95×0.98 , oe
- (b) **A1** 93.1% cao
- (b) **Answer: 93.1%**
- (c) **B1** valid explanation referring to independence, e.g. the two components are independent, so Component X failing does not change the probability of Component Y failing, meaning the individual probabilities can be multiplied, oe
- (c) **Answer: The components are independent, so one failing does not affect the probability of the other failing, meaning their probabilities can be multiplied together.**