

ANSWERS

Statistics II - Bivariate Data

Section 1:

1a) $P(B) \times P(C) = P(B \cap C) \Rightarrow 0.6 \times 0.25 = p \Rightarrow p = 0.15$

$p + q = 0.25 \Rightarrow q = 0.1$

b) $r = 1 - 0.08 - P(B) - "q" = 0.22$

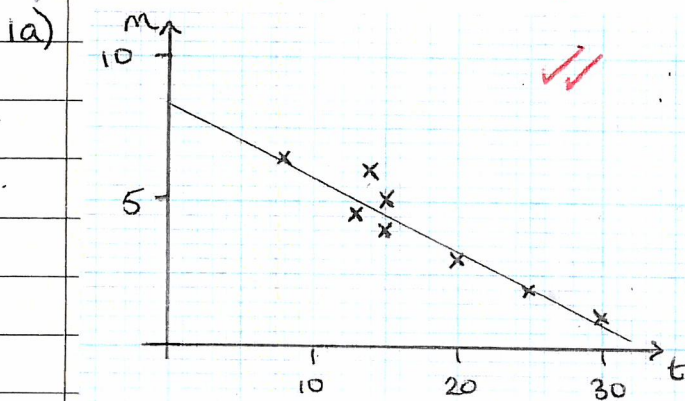
c) $s = P(A) - "r" = 0.5 - 0.22 = 0.28$

$t = P(B) - "p" - "s" = 0.6 - 0.15 - 0.28 = 0.17$

d) $P(A) = 0.5 \quad P(B) = 0.6 \quad P(A \cap B) = 0.28$
 $0.5 \times 0.6 \neq 0.28 \quad \therefore \text{not independent}$

2a) 0.2508 b) 0.01229 c) 0.05308

Section 2 (TOTAL = 25)



b) ✓✓ for line which passed through (8.47, 8.47), (30, 0.79)

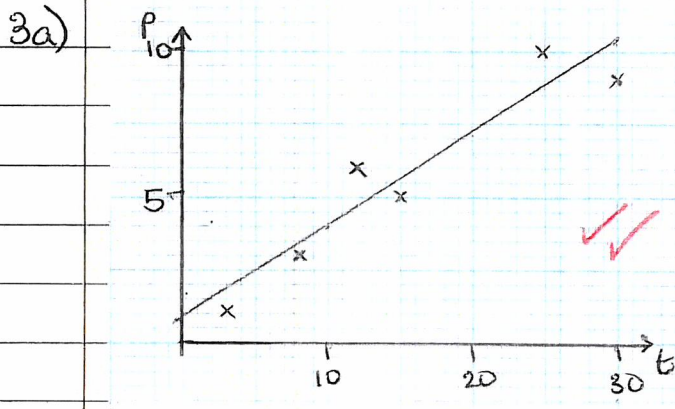
c) $8.47 - 0.256 \times 10 = 5.91$ ✓

d) Reliable as within range of data ✓ (6)

2a) The age is the explanatory variable as it is set and the weight varies according to the age ✓

b) i) $11.6 - 0.0263 \times 5 = 11.5$ (4)

ii) $t=0 \quad w=11.6, \quad t=4 \quad w=11.4948 \rightarrow \text{decrease of } 0.1g$ ✓



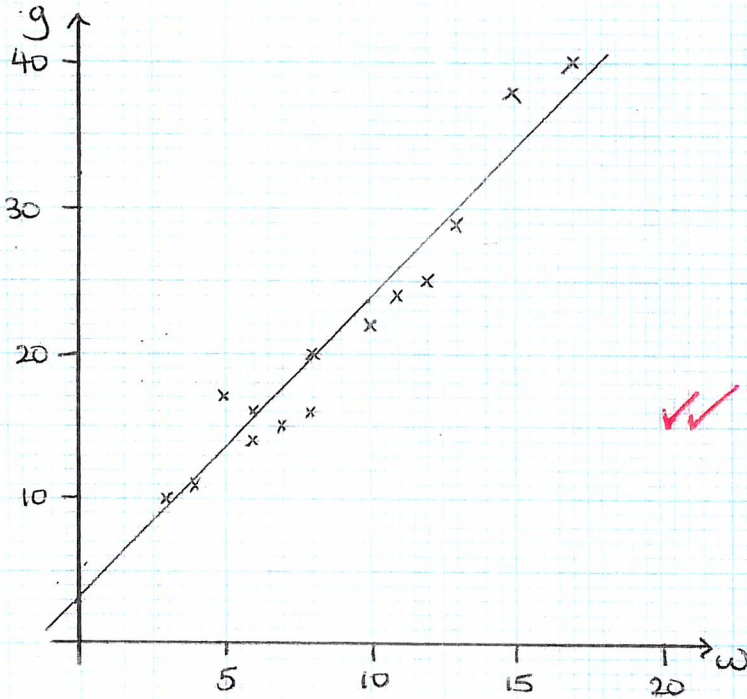
b) strong correlation ✓

c) ✓✓ for line which passed through (0, 0.741), (30, 10.281)

d) $0.741 + 0.318 \times 16 = 5.829$ (7) ✓

4)

a)



b) Fairly strong positive correlation

c) The relationship is causal as the maximum gust is related to the mean wind speed. ✓

d) ✓✓ for line passing through $(0, 2.85)$ and $(10, 23.55)$

e) $2.85 + 2.07 \times 3 = 9.06$ ✓

f) 25kn lies outside the range of the data. ✓

(8)