1. **(a)** 0.6774515

(b) 0.4132649

(c) -0.11816

(d) A one-centigrade increase in temperature corresponds to a predicted 0.4132649-unit increase in PM2.5 concentration.

(e) [0.3235709 , 0.5029589]

(f) 9.386933

(g) Yes, it is dangerous because of **extrapolation**.

(h) Since observations were collected at the same location over time, there is likely serial correlation among the datapoints.

(i) There isn't one specific correct answer. A correct answer should:

- state either "yes" or "no"
- make some reference to the linearity of the QQ-plots

2. **(a)** Answers may vary.

(b) 0.1, using the Multiplication Rule.

(c) 0.85, using the Addition Rule.

(d) $0.\overline{18}$, using either the definition of conditional probability or Bayes' Rule.

3. **(a)** Observational study.

(b) Cross-sectional study.

(c) Stratified sampling.

(d) μ_1 = average PM2.5 concentration in City A; μ_2 = average PM2.5 concentration in City B.

(e) $\begin{bmatrix} H_0: & \mu_1 = \mu_2 \\ H_A: & \mu_1 \neq \mu_2 \end{bmatrix} = \begin{bmatrix} H_0: & \mu_2 - \mu_1 = 0 \\ H_A: & \mu_2 - \mu_1 \neq 0 \end{bmatrix}$

(f) -1.448572

(g) TS $\overset{H_0}{\sim} t_{60}$

(h) 2.00

(i) Fail to reject the null.

4. **(a)** $3 \times (12)^5 \times 4$

(b) Yes

(c) 0.25

(d) 1/12