

# Solutions to Quiz 8 (version A & B)

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## Version A:

1. Which of the following statement is not true if  $y = -3x + 7$  ?
- A. The  $y$ -intercept is 7
  - B.  $y$  decreases by 3 when  $x$  increases by 4
  - C.  $y$  decreases by 3 when  $x$  increases by 1
  - D. The slope of the line is -3

**ANSWER: B**

2. The simple linear regression model is  $Y = \beta_0 + \beta_1 x + \varepsilon$ , where  $\varepsilon$  is a random variable assumed to be normally distributed with  $E(\varepsilon) = 0$  and  $V(\varepsilon) = \sigma^2$ . Let  $x^*$  denote a particular value of the independent variable  $x$ . Which of the following identity is true regarding the expected or mean value of  $Y$  when  $x = x^*$  ?

- A.  $\mu_{Y, x^*} = \beta_0 + \beta_1 x^*$
- B.  $\mu_{Y, x^*} = (\beta_0 + \beta_1) x^*$
- C.  $\mu_{Y, x^*} = \beta_1 x^*$
- D.  $\mu_{Y, x^*} = \beta_0$
- E.  $\mu_{Y, x^*} = 0$

**ANSWER: A**

## Version B:

3. Which of the following statement is not true if  $y = -3x + 7$  ?
- A. The  $y$ -intercept is 7
  - B.  $y$  decreases by 3 when  $x$  increases by 1
  - C.  $y$  decreases by 3 when  $x$  increases by 4
  - D. The slope of the line is -3

**ANSWER: C**

4. The simple linear regression model is  $Y = \beta_0 + \beta_1 x + \varepsilon$ , where  $\varepsilon$  is a random variable assumed to be normally distributed with  $E(\varepsilon) = 0$  and  $V(\varepsilon) = \sigma^2$ . Let  $x^*$  denote a particular value of the independent variable  $x$ . Which of the following identity is true regarding the expected or mean value of  $Y$  when  $x = x^*$  ?

- A.  $\mu_{Y, x^*} = \beta_1 x^*$
- B.  $\mu_{Y, x^*} = \beta_0$
- C.  $\mu_{Y, x^*} = \beta_0 + \beta_1 x^*$
- D.  $\mu_{Y, x^*} = (\beta_0 + \beta_1) x^*$
- E.  $\mu_{Y, x^*} = 0$

**ANSWER: C**

**[4 points for submission. 3 points for each question. Total is 10.]**