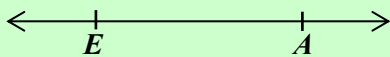


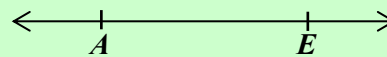
Name: _____ () Class: _____ Date: _____

Lesson Worksheet 6.4A(I)*Objective: To solve problems related to absolute error.**Absolute error is the difference between the actual value and the approximate value of a measurement.**絕對誤差是一個量的真確值與近似值之差。**Let A be the actual value and E be the approximate value. 設真確值是 A 和近似值是 E 。***(a)** If $E \leq A$, then

absolute error = $A - E$

**(b)** If $E > A$, then

absolute error = $E - A$



1. Suppose the **actual distance** (實際距離) between two bus stations is 876 m. Mary **estimates the distance** (估計該距離) to be 900 m. John **estimates the distance** (估計該距離) to be 850 m. Find the **absolute error** (絕對誤差) in

(a) Mary's estimate, **(b)** John's estimate.

Demonstration

Suppose the **actual capacity** (實際容量) of a container is 418 mL. Kitty **estimates the capacity** (估計該容量) to be 400 mL. Kelvin **estimates the capacity** (估計該容量) to be 450 mL. Find the **absolute error** (絕對誤差) in

- (a)** Kitty's estimate,
(b) Kelvin's estimate.

Solution

- (a)** Absolute error
= $(418 - 400)$ mL
= 18 mL
- (b)** Absolute error
= $(450 - 418)$ mL
= 32 mL

2. In each of the following, find the **absolute error** when the number is **rounded off to 2 significant figures** (捨入至二位有效數字).

- (a)** 4 250 **(b)** 4 476
(c) 0.048 29 **(d)** 1.961

Demonstration

In each of the following, find the absolute error when the number is rounded off to 3 significant figures (捨入至三位有效數字).

- (a)** 2374.533 **(b)** 0.025 562

Solution

- (a)** 2374.533
= 2370, *cor. to 3 sig. fig.*
Absolute error
= $2374.533 - 2370$
= 4.533
- (b)** 0.025 562
= 0.0256, *cor. to 3 sig. fig.*
Absolute error
= $0.0256 - 0.025 562$
= 0.000 038

3. In each of the following, find the **absolute error** when the number is **rounded off to 2 decimal places** (捨入至二位小數).

(a) 43.288 3

(b) 0.032 883

4. The **time interval** (時間差距) between arrival of two trains is estimated to be 7.5 min. If the **absolute error** of this estimate is 1.2 min, find the **possible actual lengths of the interval** (可能的實際時間差距).

Demonstration

The **lifetime** (壽命) of a LED light bulb is estimated to be 150 hours. If the **absolute error** is 12 hours, find the **possible actual lifetime** (可能實際壽命) of the light bulb.

Solution

Let A hours be the actual lifetime of the light bulb.

$$150 - A = 12$$

$$A = 138$$

or $A - 150 = 12$

$$A = 162$$

\therefore The possible actual lifetime of the bulb are 138 hours and 162

Try More

5. The **perimeter of a square** (正方形的周界) is estimated to be 12 cm. If the **absolute error** of this estimate is 0.1 cm, find

(a) the **possible actual perimeters** (可能實際周界) of the square.

(b) the **least possible length of a side** (最小可能邊長) of the square.