

# Linear Models & Interpretation

## Foundation to Challenge

**Practice should make the test feel easier, not merely familiar.**

Work without the answer key first. Check answers through the SAT Practice Library after completing the set.

### FOUNDATION

- 1** A plant height  $h$ , in cm, is modeled by  $h = 5f + 12$ , where  $f$  is grams of fertilizer. I. How much does one additional gram change  $h$ ? II. How many grams increase  $h$  by exactly 1 cm?

- 2** A used laptop value  $V$  from 2020 onward is modeled by  $V = 1800 - 120t$ , where  $t$  is years since 2020. What do 1800 and 120 represent?
- A. Initial value \$1800; decreases \$120 per year
  - B. Final value \$1800; increases \$120 per year
  - C. Average value \$1800; decreases \$120 total
  - D. Initial value \$120; decreases \$1800 per year

- 3** The water depth  $h = 42 - 1.5d$  models depth after  $d$  days. How does the depth change each day?
- A. decreases 1.5
  - B. increases 1.5
  - C. decreases 42
  - D. increases 42

- 4** A bakery has  $b = 260 - 22h$  loaves  $h$  hours after opening. What does 22 represent?
- A. 22 loaves remain at closing
  - B. 22 loaves are sold per hour
  - C. 22 loaves are baked per hour
  - D. the bakery closes after 22 hours

5 A utility bill is  $C(e) = 0.18e + 24$ . What does 24 represent?

- A. fixed monthly fee
- B. cost per kWh
- C. cost of 24 kWh
- D. maximum bill

6 A bicycle speed is  $s = 18 + 3t$ , where  $t$  is minutes after acceleration begins. What is  $s$  after 5 minutes?

- A. 15
- B. 18
- C. 33
- D. 45

7 A tutorial site models members by  $m = 350 + 80n$ , where  $n$  is the number of videos. Which statement is true?

- A. 80 members without videos
- B. 350 new members per video
- C. 350 members when  $n = 0$
- D. 80 videos were initially available

#### STANDARD

8 A drink recipe uses  $s = 14 - 1.5h$  teaspoons of sugar for  $h$  teaspoons of honey. What does 1.5 represent?

- A. 1.5 more sugar per honey teaspoon
- B. 1.5 fewer sugar teaspoons per honey teaspoon
- C. 1.5 honey teaspoons per sugar teaspoon
- D. 14 fewer sugar teaspoons

#### FOUNDATION

9 The temperature  $T = 72 - 4m$  models a drink  $m$  minutes after cooling starts. What is the total temperature decrease after 6 minutes?

## STANDARD

- 10** An auction price is  $p = 1200 - 15t$ , where  $t$  is seconds remaining. What does 1200 represent?

A. starting price at the beginning of timing  
B. price when  $t = 0$   
C. price decrease per second  
D. number of seconds

- 11** Pollutant mass  $y = 150 - 12x$  remains  $x$  hours after treatment begins. What does the  $x$ -intercept represent?

A. initial pollutant amount  
B. removal rate  
C. amount after 2 hours  
D. time until modeled amount reaches zero

- 12** A currency exchange uses  $y = 0.92x - 2.5$ , where  $x$  is dollars and  $y$  is euros. What does 2.5 represent?

A. a fixed 2.5-euro fee  
B. a 2.5-dollar exchange rate  
C. 2.5 euros per dollar  
D. 2.5 dollars per euro

## FOUNDATION

- 13** Room temperature  $T = 61 + 6h$  degrees  $F$  after  $h$  hours. What is the increase every 30 minutes?

- 14 A container has  $f(x) = 30 - 5x$  ounces of juice after  $x$  servings are made. What is the  $y$ -intercept?
- A. 30 ounces initially
  - B. 5 ounces initially
  - C. 30 ounces used per serving
  - D. 5 servings total

## ADVANCED

- 15 The equation  $3y - x = 18$  relates gallons  $y$  to the number  $x$  of turtles. Which statement is true?
- A. one turtle needs 3 gallons
  - B. one additional turtle increases  $y$  by  $\frac{1}{3}$  gallon
  - C. one gallon supports 3 turtles
  - D. one turtle decreases water by  $\frac{1}{3}$  gallon

## FOUNDATION

- 16 Mailing cost  $C = 2 + 3x$  dollars for  $x$  pounds. A \$15 increase in cost corresponds to how many additional pounds?

- 17 A plumber charges  $a$  one-time fee plus an hourly rate. In a graph of total charge versus hours, what does the slope represent?
- A. hourly rate
  - B. one-time fee
  - C. maximum charge
  - D. total charge

# FINISHED?

## Check your answers online

[aryalanupme.github.io/sat-linear-models.html](https://aryalanupme.github.io/sat-linear-models.html)

Do not stop at “wrong.” Identify why it was wrong: concept, algebra, arithmetic, interpretation, calculator choice, or timing.

**I do not correct the answer first. I correct the reason.**

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