

Slope-Intercept Form on the Digital SAT

$y = mx + b$ | the one-page cheat sheet | unlimitedtests.com

THE FORM

$$y = m x + b$$

m = slope. How much y changes when x goes up by 1.

b = y-intercept. The value of y when x = 0 (the start).

READING THE SLOPE

m > 0: line rises left to right. **m < 0:** line falls.

Bigger |m|: steeper. **Smaller |m|:** flatter.

m = 0: horizontal line ($y = b$).

Vertical line ($x = 3$): slope is UNDEFINED.

SLOPE FROM TWO POINTS

$$m = (y_2 - y_1) / (x_2 - x_1)$$

Keep the order consistent top and bottom.

Write out negatives in parentheses: $(-7 - 5)$.

Example: (3, 7) and (8, 27): $m = 20 / 5 = 4$.

ANY EQUATION --> $Y = MX + B$

Rule: isolate y. Then m and b are visible.

$6x - 3y = 12$ -> $y = 2x - 4$ ($m = 2$, $b = -4$)

$Ax + By = C$: slope shortcut $m = -A / B$.

Point-slope $y - 3 = 5(x - 2)$: the slope is the 5.

In Desmos: type it AS WRITTEN - it graphs any form.

PARALLEL & PERPENDICULAR

Parallel: equal slopes ($m_1 = m_2$).

Perpendicular: negative reciprocals ($m_1 \times m_2 = -1$).

Example: slope $2/3$ -> perpendicular slope $-3/2$.

Compare slopes ONLY after both are in $y = mx + b$.

WORD-PROBLEM PHRASEBOOK

"per / each / every" -> the rate = m (multiplies x).

"flat fee / starting" -> the constant = b.

"total / costs / is" -> the output and equals sign.

$C = 25m + 40$: 25 = monthly rate, 40 = one-time fee.

Decreasing? (draining, spending) -> m is negative.

GRAPH-MATCH CHECKLIST

1. Where does the line cross the y-axis? That is b.

2. Rising or falling? Sign of m.

3. Steep or gentle? Size of |m|.

Intercept + slope sign kills 3 of 4 choices fast.

THE TRAPS

$y = 4x - 6$: the intercept is -6, NOT 6.

You cannot read m off $3x + y = 12$. Isolate y first.

x-intercept: set $y = 0$. y-intercept: set $x = 0$.

Answer the question asked (x + y, cost of 3, ...).

60-SECOND WORKED EXAMPLE

Q: A ride service charges a one-time \$3 pickup fee plus \$2 per mile. Which equation gives the total cost C for m miles, and what does the 2 represent?

1. "per mile" marks the 2 as the RATE -> it multiplies m. "pickup fee" marks the 3 as the CONSTANT -> it stands alone.

2. Equation: $C = 2m + 3$. (Rate x variable + flat amount — the $y = mx + b$ pattern wearing word-problem clothes.)

3. The 2 is the slope: the cost added for EACH extra mile — the SAT calls this the "rate of change."

Check: 5 miles -> $C = 2(5) + 3 = 13$. Ten dollars of driving plus the three-dollar fee. Sensible.

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