LESSON MAKER PRO

Forms That Fit

Choose and convert linear equations for a purpose.

HIGH SCHOOL · MT.CORE.ALG.LIN.4

MT.CORE.ALG.LIN.4 "Understand that linear equations can be represented in multiple forms and the specific features of each form by: Choosing the form strategically when writing an equation based on given information and intended use..."

NAME _____ **DATE** _____

CHOOSE A USEFUL FORM

Slope-intercept form, $y=mx+b$, shows the rate of change m and the initial value b. Point-slope form, $y-y_1=m(x-x_1)$, uses a known point and slope. In standard form, $Ax+By=C$, set $y=0$ to find the x-intercept or $x=0$ to find the y-intercept.

WORKED EXAMPLE

A line passes through (9, 8) and has slope -4/3. Write its equation in point-slope, slope-intercept, and standard form.

1. Use the point and slope: $y-8=-4/3(x-9)$.
2. Distribute: $y-8=-4/3x+12$.
3. Add 8: $y=-4/3x+20$.
4. Multiply by 3 and rearrange: $4x+3y=60$.

Answer: Point-slope: $y-8=-4/3(x-9)$; slope-intercept: $y=-4/3x+20$; standard: $4x+3y=60$.

PRACTICE 6 problems

1 A line has slope 2 and passes through (1, 5). Write its equation in point-slope form.

ANSWER _____

2 Convert $y+2=-3(x-1)$ to slope-intercept form.

ANSWER _____

3 Convert $y=1/2x-5$ to standard form with integer coefficients and a positive coefficient of x.

ANSWER _____

4 Find the x- and y-intercepts of $2x+5y=10$. Give each as an ordered pair.

ANSWER _____

5 A line has slope -2 and y-intercept 7. Write its equation in slope-intercept form. State its rate of change and initial value.

ANSWER _____

6 A line passes through (2, -5) and (6, 1). Write its equation in point-slope form using (2, -5).

ANSWER _____

APPLY IT Show your work

1 A school music club charges a one-time $7 registration fee and $2 for each month of membership. Let x be the number of months and y be the total cost in dollars. Write an equation in slope-intercept form. What do its slope and y-intercept mean?

WORK SPACE

ANSWER _____

2 For a school concert, student tickets cost $6 and guest tickets cost $10. The ticket booth brings in $150. Let x be the number of student tickets and y be the number of guest tickets. Write a standard-form equation and find both intercepts. What does each intercept mean?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A line passes through (1, 3) and has the same x-intercept as 2x+5y=14. Find the line's equation in standard form and slope-intercept form. Explain how you used the intercept.

WORK SPACE AND ANSWER

Forms That Fit

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A line has slope 2 and passes through (1, 5). Write its equation in point-slope form.	**y-5=2(x-1)**
2	Convert y+2=-3(x-1) to slope-intercept form.	**y=-3x+1**
3	Convert y=1/2x-5 to standard form with integer coefficients and a positive coefficient of x.	**x-2y=10**
4	Find the x- and y-intercepts of 2x+5y=10. Give each as an ordered pair.	**x-intercept: (5, 0); y-intercept: (0, 2)**
5	A line has slope -2 and y-intercept 7. Write its equation in slope-intercept form. State its rate of change and initial value.	**y=-2x+7; rate of change: -2; initial value: 7**
6	A line passes through (2, -5) and (6, 1). Write its equation in point-slope form using (2, -5).	**y+5=3/2(x-2)**

PART 2 · APPLY IT

1. **y=2x+7. The slope means the cost rises $2 per month. The y-intercept means the cost at 0 months is the $7 registration fee.** Use the monthly charge as the slope and the one-time fee as the initial value.
2. **6x+10y=150. The x-intercept is (25, 0), meaning 25 student tickets and no guest tickets. The y-intercept is (0, 15), meaning no student tickets and 15 guest tickets.** Set y=0 to find the student-ticket-only total, then set x=0 to find the guest-ticket-only total.

CHALLENGE

Setting y=0 in 2x+5y=14 gives the x-intercept (7, 0). The slope through (1, 3) and (7, 0) is -1/2, so the equation is x+2y=7 in standard form and y=-1/2x+7/2 in slope-intercept form.

Accept equivalent point-slope equations when the prompt does not specify a point. For standard form, accept equivalent equations with integer coefficients and a positive coefficient of x.