LESSON MAKER PRO

Lines on the Move

Translate lines and track what changes.

HIGH SCHOOL · FA.F.26

FA.F.26 "Perform simple translations on linear functions given in a variety of forms (e.g., two points, a graph, a table of values, a mapping, slope-intercept form, or standard form)..."

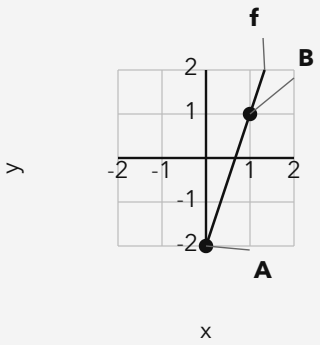
NAME _____ DATE _____

THE BIG IDEA

For y=mx+b, a shift up adds to b, while a shift down subtracts from b. A shift right by h gives y=m(x-h)+b. These shifts change the line's position, not its slope.

WORKED EXAMPLE

The graph shows f. Shift f up 5 units. Write the new equation.



1. From A and B, the slope is (1-(-2))/(1-0)=3.
2. The y-intercept moves from -2 to -2+5=3.
3. Keep the slope: y=3x+3.

Answer: y=3x+3

PRACTICE 4 problems

1 Shift y=2x+4 down 6 units. Write the new equation.

ANSWER _____

2 A line passes through (0,1) and (2,5). Shift it up 4 units. Write the new equation.

ANSWER _____

3 Shift x+2y=6 right 2 units. Write the new equation in slope-intercept form.

ANSWER _____

4 Shift y=x/2-1 up 2 units. Write the new equation and compare its steepness with y=x.

ANSWER _____

APPLY IT Show your work

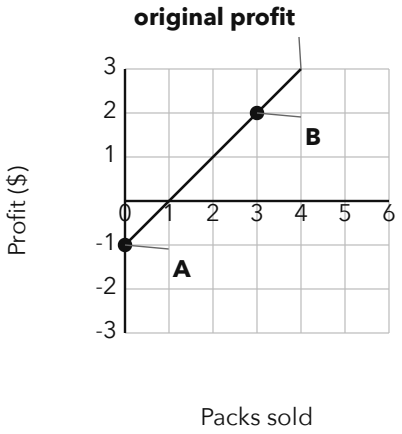
1 A ride-share app shows its fare in the table. The start fee rises by $3, but the price per mile stays the same. Write the new fare y for x miles.

ORIGINAL FARE

Miles x	Fare y ($)
0	4
2	8
4	12

ANSWER _____

2 The graph shows a school club's profit y in dollars after selling x packs of stickers. A new printer adds $2 to the fixed cost. Write the new profit equation.



ANSWER _____

CHALLENGE One step up

Shift 2x+y=1 right 3 units, then down 4 units. Write the new equation in slope-intercept form. Explain why its y-intercept rises even though the last shift is down.

WORK SPACE AND ANSWER

ANSWER KEY

Lines on the Move

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Shift y=2x+4 down 6 units. Write the new equation.	**y=2x-2**
2	A line passes through (0,1) and (2,5). Shift it up 4 units. Write the new equation.	**y=2x+5**
3	Shift x+2y=6 right 2 units. Write the new equation in slope-intercept form.	**y=-x/2+4**
4	Shift y=x/2-1 up 2 units. Write the new equation and compare its steepness with y=x.	**y=x/2+1; it is less steep than y=x.**

PART 2 · APPLY IT

1. **y=2x+7** The fare rises $4 over 2 miles, so the rate is $2 per mile. Add $3 to the original $4 start fee.
2. **y=x-3** The graph shows a slope of 1 and a y-intercept of -1. The added fixed cost lowers profit at every x by $2.

CHALLENGE

y=-2x+3. Shifting right 3 raises the y-intercept by 6; shifting down 4 then lowers it by 4. The net change is an increase of 2.

Accept equivalent equations unless slope-intercept form is requested. For the steepness comparison, accept "flatter" or "less steep."