LESSON MAKER PRO

Lines in Action

Solve, graph, and model linear relationships.

HIGH SCHOOL · MA.912.AR.2

MA.912.AR.2 "Write, solve and graph linear equations, functions and inequalities in one and two variables."

NAME _____ DATE _____

GRAPHING LINEAR RELATIONSHIPS

Rewrite a linear equation or function in y = mx + b form when possible. Choose points that satisfy the rule, plot them, and draw a straight line through them. For an inequality, use a solid boundary for <= or >= and a dashed boundary for < or >. Flip the inequality sign only when you multiply or divide by a negative number.

WORKED EXAMPLE

Graph y = 5x + 12.

1. Choose x = -2: y = 5(-2) + 12 = 2.
2. Choose x = 0: y = 5(0) + 12 = 12.
3. Plot (-2, 2) and (0, 12).
4. Draw a straight line through the points.

Answer: Line through (-2, 2) and (0, 12).

PRACTICE 6 problems

1 Part 1 PRACTICE: Solve 4x + 7 = 31.

ANSWER _____

2 Part 1 PRACTICE: Graph y = -3x + 8. Give coordinates for points you can plot.

ANSWER _____

3 Part 1 PRACTICE: Solve 9x - 4 > 23.

ANSWER _____

4 Part 1 PRACTICE: For f(x) = 7x - 9, find f(4).

ANSWER _____

5 Part 1 PRACTICE: Graph y = -6x + 1. Give coordinates for points you can plot.

ANSWER _____

6 Part 1 PRACTICE: Graph 3x + 4y <= 24. State whether the boundary is solid or dashed and which region to shade.

ANSWER _____

APPLY IT Show your work

1 Part 2 APPLY: A gaming center charges a $9 entry fee plus $4 for each round you play. Write a function C(x) for the total cost of x rounds. Then find the cost of 6 rounds.

WORK SPACE

ANSWER _____

2 Part 2 APPLY: You have $17 saved for a concert ticket that costs $65. You earn $8 for each dog walk. Write and solve an inequality to find the least number of dog walks you need.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Part 3 CHALLENGE: Graph $4x - 3y < 21$. Rewrite the inequality in y form, then explain why the boundary is dashed and why you shade the region above or below it.

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ANSWER KEY

Lines in Action

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Part 1 PRACTICE: Solve 4x + 7 = 31.	**x = 6**
2	Part 1 PRACTICE: Graph y = -3x + 8. Give coordinates for points you can plot.	**For example, plot (3, -1) and (4, -4), then draw the line through them.**
3	Part 1 PRACTICE: Solve 9x - 4 > 23.	**x > 3**
4	Part 1 PRACTICE: For f(x) = 7x - 9, find f(4).	**f(4) = 19**
5	Part 1 PRACTICE: Graph y = -6x + 1. Give coordinates for points you can plot.	**For example, plot (3, -17) and (4, -23), then draw the line through them.**
6	Part 1 PRACTICE: Graph 3x + 4y <= 24. State whether the boundary is solid or dashed and which region to shade.	**y <= -3/4x + 6. Draw a solid boundary through, for example, (4, 3) and (-4, 9), then shade below the line.**

PART 2 · APPLY IT

1. **C(x) = 4x + 9; C(6) = 33, so the cost is $33.** The entry fee is the starting value, and each round adds $4. Substitute x = 6 into C(x) = 4x + 9.
2. **17 + 8x >= 65; x >= 6. You need at least 6 dog walks.** Add earnings from x dog walks to the $17 already saved. Solve 17 + 8x >= 65, then use a whole-number number of walks.

CHALLENGE

y > 4/3x - 7. Draw a dashed boundary line and shade above it. The boundary is dashed because points on the line are not included, and y values greater than the line's y values are above the line.

Accept any correct points on each requested line and equivalent forms of equations or inequalities. For graphs, accept a correctly drawn boundary with the required solid or dashed style and correct shaded region.