

TASK 2.7.4: THE ABCS OF GRAPHING

Solutions and directions

- Activity 1:

Provide each student with an A, B, C Grid and one transparency line. Allow one student to be at the overhead (turned off) with a transparency of the A, B, C grid and a 1 transparency line. This will allow the teacher freedom to monitor the rest of the students' participation.

All the equations in this activity have been selected to ensure no mathematical manipulation is required. The slope can be counted on the grid and the y-intercept is an integer value that can be read from the grid.

For Activity 1, there are three possible variations.

- Given 2 lettered points, students will use their transparency line to create the line through the points and write the equation.

Questions for Students:

- How did you determine the equation?
- What did you do first? (If the student says counted slope – ask if they could have used the y-intercept first)
- What does this step tell you about the linear rule for these two points?
- Give the points A and E and have students determine the equation of the line. Ask them to find to other points that would create a line parallel to this one. Have students explain how they found the line. Is there only one lettered set of points that would create a line parallel to the line A, E?
- Is there another line through lettered points that would have the same y-intercept as the line A,E, but a different slope? Have students demonstrate how they determined this.
- Give students the equation of a line and ask which points the line will includes.

Questions for Students

- How did you determine the points?
- What did you do first?
- Could you start with the slope first? Explain

- Give students the slope and one point, have them create the line and write the equation.

Questions for Students

- How did you determine the equation?
- Could you determine the equation if you had a lettered point and the y-intercept? Explain

As the teacher observes students' progress, he/she can have the student at the overhead turn on the overhead and all students can discuss and check their work. Students can also check their work using the graphing calculator. They can graph the equation in $y =$ form and check for the given points.

- Activity 2:

This activity will provide students with an opportunity to change equations from standard form to slope intercept form.

Provide each student with an A, B, C Grid and one transparency line. Allow one student to be at the overhead (turned off) with a transparency of the A, B, C grid and a 1 transparency

In this activity teacher will give students the equation of a line in standard form and students will determine which points are included on the line.

Other than changing the form of the equation to graph, all information (slope and y-intercept) can be read off the grid.

Questions for students

- What did you do first? Why
- Is there another way to determine the points?
- Without changing from standard form, given a point can you determine if it will lie on the line? Explain.

As the teacher observes students' progress, he/she can have the student at the overhead turn on the overhead and all students can discuss and check their work. Students can also check their work using the graphing calculator. They can graph the equation in $y =$ and go to the graph and check for the given points.

- Activity 3:

This activity will require students to mathematically determine the y-intercept. The y-intercept is not an integer value and thus can't be read off the graph.

Questions for Students

- Given to lettered points, explain how you determined the equation of the line.

Algebra I: Strand 2. Linear Functions; Topic 7. Connect and Change; Task 2.7.4

- Is there another way to determine the equation of the line?
- Can you find the lettered points on the line given the equation? Explain

The teacher will give students either two points or the slope of the line and a point. The students use their transparency line to graph the line and then will write the equation of the line.

TASK 2.7.4: THE ABCS OF GRAPHING

Activity 1

1. $y = 2x - 3$ (A, E, F) A = (2, 1) E = (4, 5) F = (1, -1)
2. $y = -2x + 5$ (A, G, M, N) A = (2, 1) G = (1, 3) M = (0, 5) N = (3, -1)
3. $y = -\frac{5}{2}x + 6$ (A, H) A = (2, 1) H = (0, 6)
4. $y = \frac{1}{2}x$ (A, K, O) A = (2, 1) K = (-2, -1) O = (0, 0)
5. $y = 1$ (A, S) A = (2, 1) S = (-2, 1)
6. $x = 2$ (A, W) A = (2, 1) W = (2, 4)
7. $y = -\frac{2}{3}x + 6$ (C, H) C = (6, 2) H = (0, 6)
8. $y = -\frac{1}{2}x + 5$ (C, M, W) C = (6, 2) M = (0, 5) W = (2, 4)
9. $y = x - 4$ (C, N) C = (6, 2) N = (3, -1)
10. $y = -\frac{6}{5}x + 6$ (B, H) B = (5, 0) H = (0, 6)

*Algebra I: Strand 2. Linear Functions; Topic 7. Connect and Change; Task 2.7.4*The ABC's of Graphing a Line
Activity 2

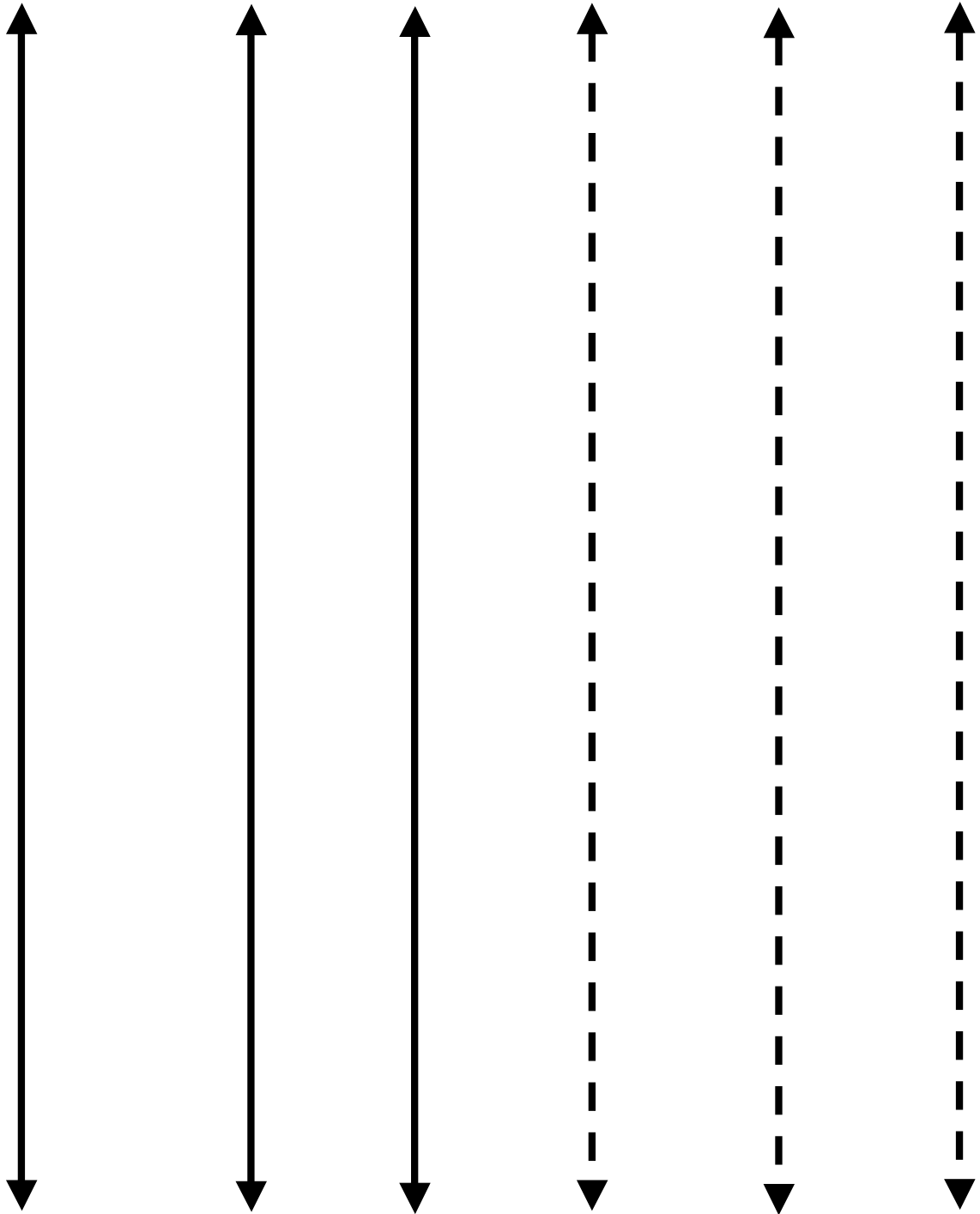
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|---------------------|------|---------------|---------------|
| 1. $5x + 2y = 12$ | A, H | $A = (2, 1)$ | $H = (0, 6)$ |
| 2. $-3x + 2y = -4$ | A, V | $A = (2, 1)$ | $V = (0, -2)$ |
| 3. $6x + 5y = 30$ | B, H | $B = (5, 0)$ | $H = (0, 6)$ |
| 4. $-2x + 5y = -10$ | B, V | $B = (5, 0)$ | $V = (0, -2)$ |
| 5. $2x + 3y = 18$ | C, H | $C = (6, 2)$ | $H = (0, 6)$ |
| 6. $x + 2y = 10$ | C, M | $C = (6, 2)$ | $M = (0, 5)$ |
| 7. $-2x + 3y = -6$ | C, V | $C = (6, 2)$ | $V = (0, -2)$ |
| 8. $-x + 7y = -14$ | D, V | $D = (7, -1)$ | $V = (0, -2)$ |
| 9. $-7x + 4y = -8$ | E, V | $E = (4, 5)$ | $V = (0, -2)$ |
| 10. $-x + 2y = 6$ | E, W | $E = (4, 5)$ | $W = (2, 4)$ |

Algebra I: Strand 2. Linear Functions; Topic 7. Connect and Change; Task 2.7.4

The ABC's of Graphing a Line
Activity 3

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|---------------------------------------|------|------------|--------------|
| 1. $y = -\frac{1}{3}x + \frac{5}{3}$ | A, B | A = (2, 1) | B = (5, 0) |
| 2. $y = \frac{1}{4}x + \frac{1}{2}$ | A, C | A = (2, 1) | C = (6, 2) |
| 3. $y = -\frac{2}{5}x + \frac{9}{5}$ | A, D | A = (2, 1) | D = (7, -1) |
| 4. $y = -\frac{2}{3}x + \frac{7}{3}$ | A, J | A = (2, 1) | J = (-1, 3) |
| 5. $y = -\frac{1}{2}x + \frac{5}{2}$ | B, D | B = (5, 0) | D = (7, -1) |
| 6. $y = \frac{1}{4}x - \frac{5}{4}$ | B, F | B = (5, 0) | F = (1, -1) |
| 7. $y = -\frac{3}{4}x + \frac{15}{4}$ | B, G | B = (5, 0) | G = (1, 3) |
| 8. $y = \frac{1}{7}x - \frac{5}{7}$ | B, K | B = (5, 0) | K = (-2, -1) |
| 9. $y = -\frac{3}{8}x + \frac{15}{8}$ | B, P | B = (5, 0) | P = (-3, 3) |
| 10. $y = -\frac{1}{7}x + \frac{5}{7}$ | B, S | B = (5, 0) | S = (-2, 1) |

Transparency Lines



Coordinate Grid

