WAMC Lab Template

Math Concept(s): Calculating slope from two points

Source / Text:

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Attach the following documents:

- Lab Instructions
- Student Handout(s)
- Rubric and/or Assessment Tool

Short Description (Be sure to include where in your instruction this lab takes place):

Lab Plan

Lab Title: Slope Bingo

Prerequisite skills: Students should understand slope of a line, graphing a line, and calculations of two points.

Lab objective: Students will play bingo but must calculate the slope from the two points presented, then locate the slope on their card.

Standards: (Note SPECIFIC relationship to Science, Technology, and/or Engineering)

Mathematics K–12 Learning Standards:

- HSA-CED.A Create equations that describe numbers or relationships
- HSS-ID.C.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

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Standards for Mathematical Practice:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Use appropriate tools strategically.
- Attend to precision.

K-12 Learning Standards-ELA (Reading, Writing, Speaking & Listening):

- RI.9-10.1 Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- RI.9-10.2 Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.

K-12 Science Standards

-

Technology

-

Engineering

- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

Leadership/21st Century Skills:

21st Century Interdisciplinary themes (Check those that apply to the above activity.)
Global Awareness Financial/Economic/Business/Entrepreneurial Literacy Civic Literacy
Health/Safety Literacy Environmental Literacy

21st Century Skills (Check those that students will demonstrate in the above activity.)

LEARNING AND INNOVATION	**INFORMATION, MEDIA & TECHNOLOGY SKILLS**	**LIFE & CAREER SKILLS**	**Productivity and Accountability**
Creativity and Innovation	Information Literacy	Flexibility and Adaptability	Manage Projects
Think Creatively	X Access and Evaluate Information	X Adapt to Change	X Produce Results
Work Creatively with Others	X Use and manage Information	Be Flexible	Leadership and Responsibility
Implement Innovations	Media Literacy	Initiative and Self-Direction	Guide and Lead Others
Critical Thinking and Problem Solving	Analyze Media	Manage Goals and Time	Be Responsible to Others
Reason Effectively	Create Media Products	X Work Independently	
X Use Systems Thinking	Information, Communications and Technology (ICT Literacy)	Be Self-Directed Learners	
Make Judgments and Decisions	Apply Technology Effectively	Social and Cross-Cultural	
X Solve Problems		Interact Effectively with Others	
		Work Effectively in Diverse Teams	

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Communication and Collaboration
Communicate Clearly
Collaborate with Others

Teacher Preparation: (What materials and set-up are required for this lab?)

Materials

- Slope Bingo Cards
- Slope Bingo PPT
- Paper, for calculating slope from two points, collected as part of summative assessment.

Set-Up Required:

- Projector, student desks, bingo cards, bingo card markers, paper

Lab Organization Strategies:

Leadership (Connect to 21st Century Skills selected):

- Students will use systems and equations to calculate slope from two points, solve problems that arise, access and evaluate problems, possibly work with others that have different perspectives or priorities, use time wisely (quickly solving problems in competition), produce results, solutions, to problems presented.

Cooperative Learning:

- Students are engaged in competitive learning through game play.

Expectations:

- Students will increase slope from two points calculation understanding through repetitive, competitive play.

Timeline:

- Game can last partial or whole class period (30 to 60 minutes).

Post Lab Follow-Up/Conclusions:

Discuss real world application of learning from lab

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- Real world applications would be realized in any field that requires employees to follow simple direction. Students will also engage in healthy competition.

Career Applications

- Career applications would involve problem solving.

Optional or Extension Activities

- Game play allows students to engage their competitive nature, which promotes learning on a quicker level. Students will practice processes

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Using Slope Formula BINGO

$$\frac{y_2 - y_1}{x_2 - x_1}$$

BINGO GAME!

* Require students to show their work with this BINGO game because we all know students who find the slope without writing it down will get it wrong more often then not. Have them hand in their work after the activity.

Teacher slide!

Instructions and information for SLOPE BINGO

- On slide 4, click on the icon to be taken to the slide with two points.
- Students will calculate slope, then try to locate the solution on their card.
  - Remind students to not shout out the answer! However, you will announce the solution before moving on to the next one.
- Click on the arrow at the bottom of the slide to return to the icon slide.
- Make sure you explain the rules of winning before you play. Believe it or not some students need to be reminded.
- Have students mark BINGO cards with coins or beans. Then reuse the cards for future games.
- Optional : While playing BINGO have students show their work on a separate paper to hand in at the end of the activity.
- SLOPE BINGO is a great warm-up or review activity.

Teacher Slide Answer Sheet
(by numbers at the top the slides)

3: 1/2

4: -1/2

5: 2

6: -2

7: 1

8: -1

9: 3

10: -1/3

11: 1/3

12: -3

13: 1/4

14: 4

15: -4

16: -1/4

17: -1/5

18: 1/5

19: 5

20: -5

21: 2/3

22: -2/3

23: -3/2

24: 3/2

25: 3/4

26: 4/3

27: -3/4

28: -2/5

29: -4/3

30: -5/2

31: 2/5

32: 5/2

33: -5/4

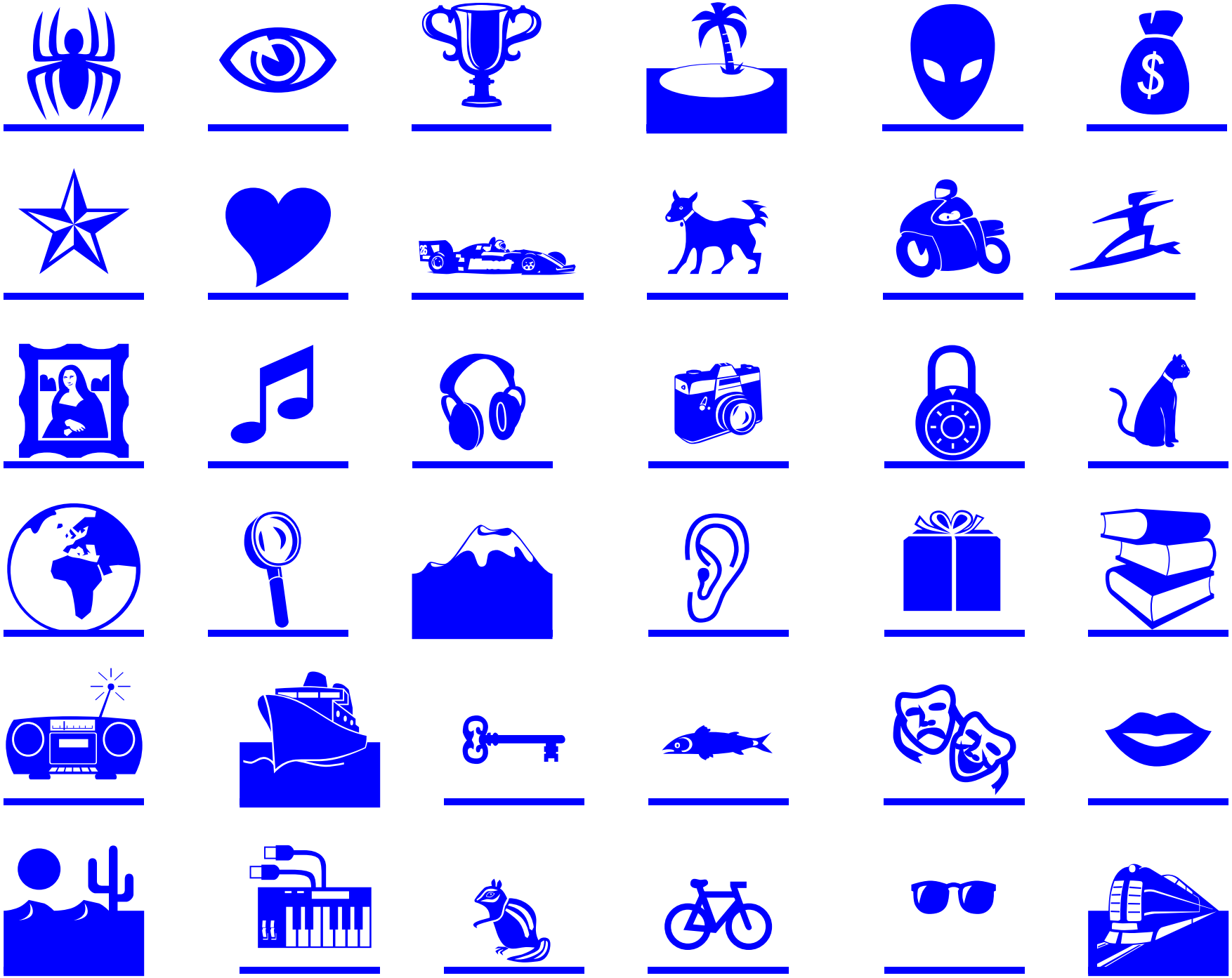
34: 5/4

35: 4/5

36: -4/5

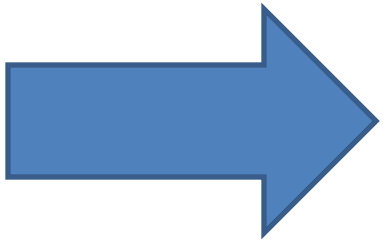
37: 0

38: undefined



3

(-2, 2) (-8, -1)



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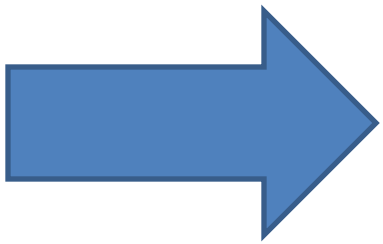
(-1, -3) (1, -4)



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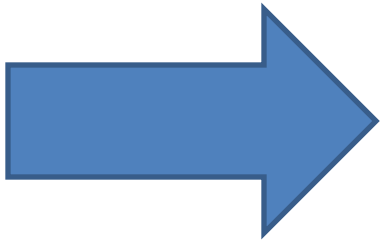
(0, 2) (5, 12)



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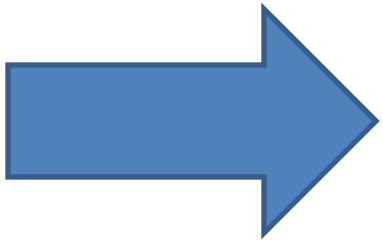
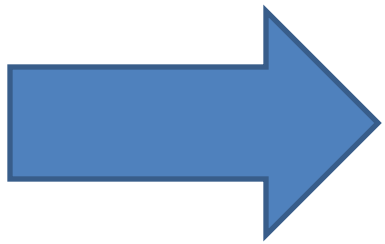


7

(6, -1) (-3, -10)



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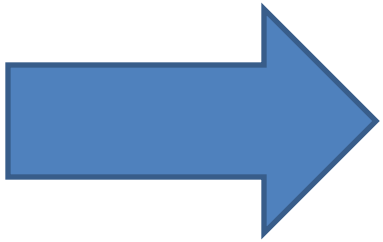
(-5, 7) (5, -3)



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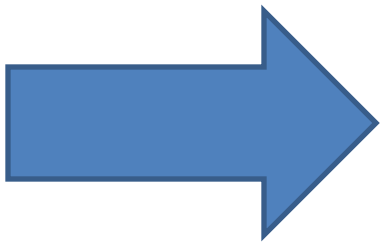
(2, -1) (6, 11)



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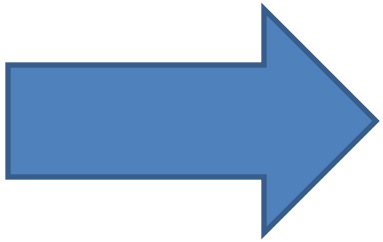
(-5, 2) (4, -1)



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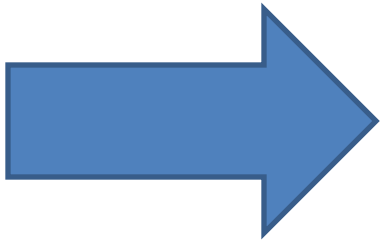
(-1, 8) (2, 9)



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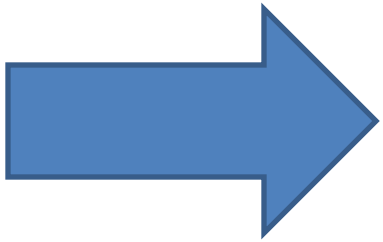
(1, -9) (-1, -3)



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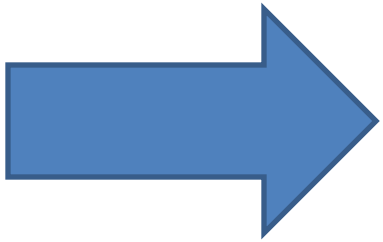
(-9, 5) (-1, 7)



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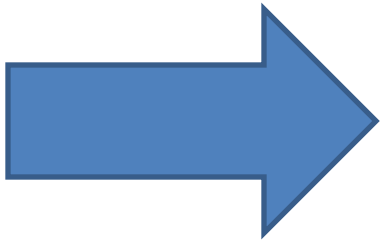
(3, -11) (5, -3)



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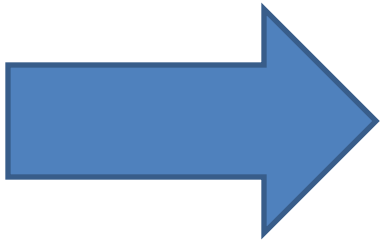
(-2, 8) (2, -8)



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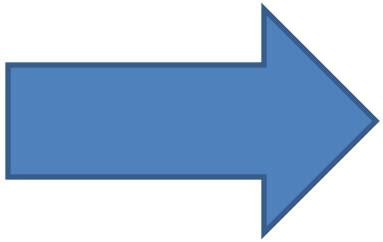
(-7, 7) (-3, 6)



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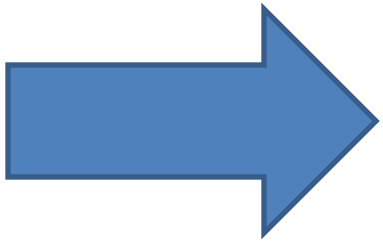
(-7, 1) (-2, 0)



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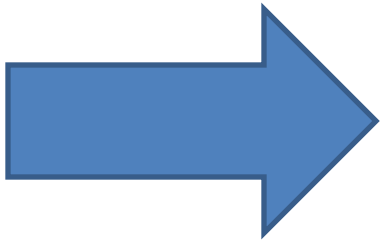
(9, -2) (4, -3)



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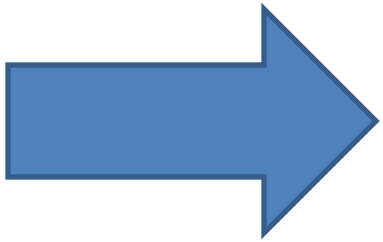
(5, 6) (2, -9)



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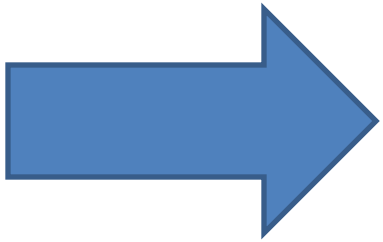
(4, -1) (3, 4)



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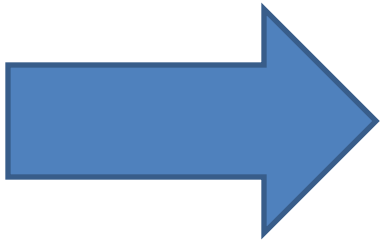
(-2, -8) (7, -2)



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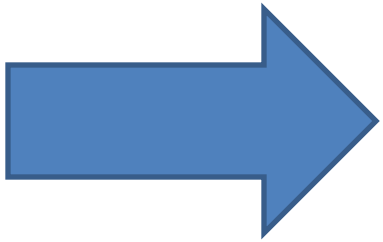
(3, -2) (9, -6)



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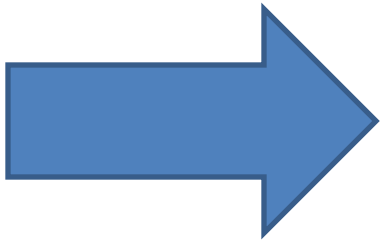
(-3, 10) (3, 1)



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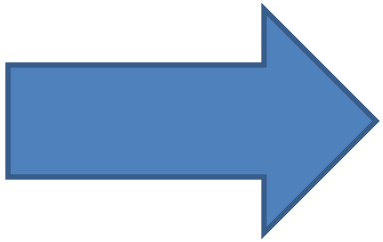
(-3, -4) (-5, -7)



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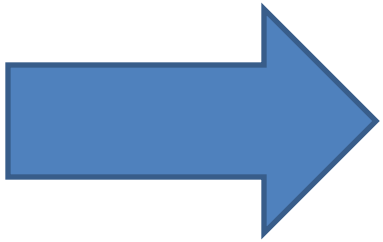
(5, -1) (-7, -10)



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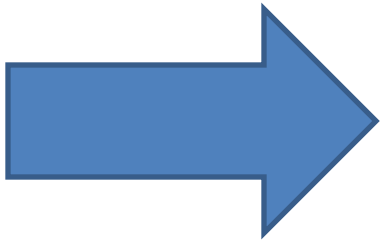
(3, 5) (6, 9)



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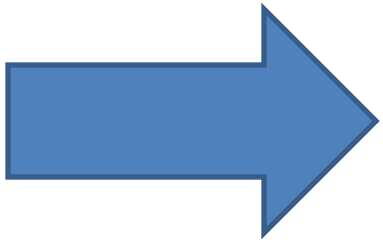
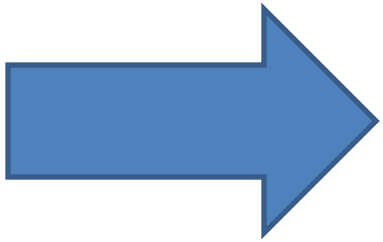
(-3, -1) (5, -7)



28

(-10, -4) (0, -8)



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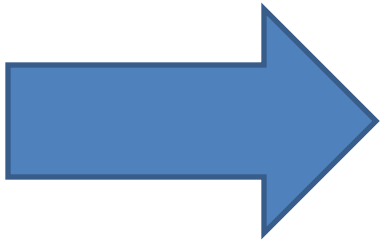
(1, 6) (10, -6)



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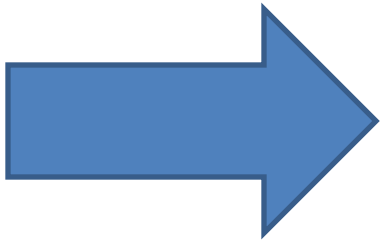
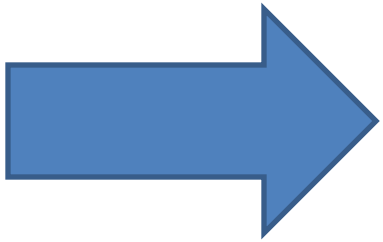
(-4, -4) (-6, 1)



31

(-7, 0) (8, 6)



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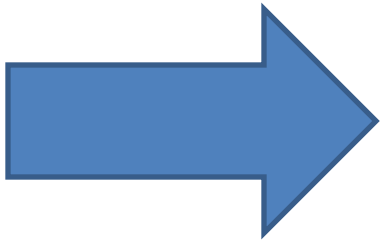
(2, 8) (0, 3)



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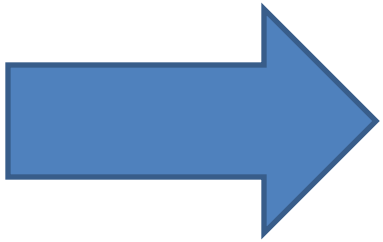
(2, -1) (10, -11)



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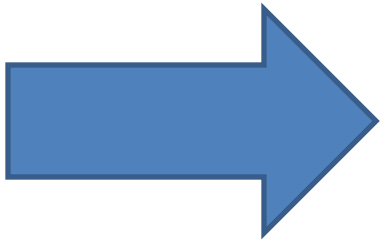
(-9, -7) (3, 8)



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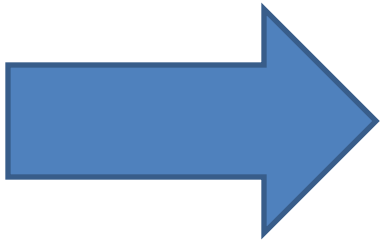
(-4, 7) (1, 11)



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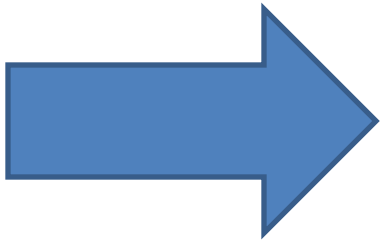
(2, -5) (-3, -1)



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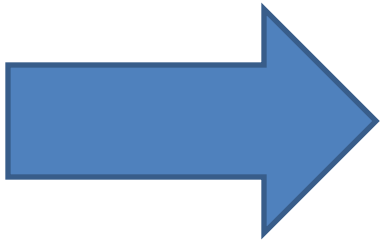
(-4, -5) (4, -5)



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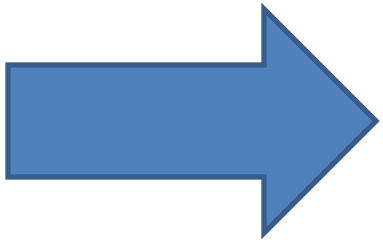
(-3, 4) (-3, -2)