

Name(s) \_\_\_\_\_

# PLANNING A CITY

## ON A COORDINATE GRID

You have established a city that is just beginning to grow. You will need to put a plan into place so your city will grow successfully and efficiently.

**Name your city:** \_\_\_\_\_

**PART A:** Locate the following landmarks on a coordinate plane. (If you are creating your own, use graph paper, and draw the origin in the middle. The grid should extend 20 units in all directions.) Each unit on your paper will represent 0.1 of a mile. As you add features to your city throughout the activity, be sure to mark and label each one on your grid.

Some landmarks are established in your city and would be very difficult to relocate. Locate and place these landmarks on your grid with a dot and label:

- Courthouse (-2, 11)
- Electric Company (-7, -4)
- School (0, 7)
- Historic Mansion (-14, 4)
- A river runs through your city following the equation  $y = 2x - 5$ .
- The main highway runs through your city following the equation  $4x + 3y = 12$
- The only other paved road (1<sup>st</sup> Street) currently runs from the courthouse to the electric company.

*Note: During this activity, you may draw roads running through landmarks. Because your map has a small scale, roads and landmarks may appear to overlap when they are separated by several feet in distance in reality.*

Your city would like to attract tourists, so you will need a tourist center at the point where the main highway and 1<sup>st</sup> Street intersect. Where will the tourist center be located? \_\_\_\_\_

**PART B:** Plan 4 new roads to run parallel to 1<sup>st</sup> Street. You should pick the locations thoughtfully, planning for where you think you will have traffic. Write the equations for these roads.

STREET NAME	EQUATION

**PART C:** Now establish 5 additional roads to run perpendicular to 1<sup>st</sup> Street.

STREET NAME	EQUATION

**PART D:** Will you need any bridges on these new streets? What coordinates will require bridges?

**PART E:** Your city has funds to establish 4 of the following buildings/landmarks. Decide which 4 would be best for your city, and pick a location for each one. Add them to your map, and give their coordinates.

- |             |          |                |
|-------------|----------|----------------|
| Post Office | Arena    | Theme Park     |
| Park        | Hotel    | Police Station |
| Zoo         | Monument | Fire Station   |

BUILDING / LANDMARK	COORDINATES

A large company has also decided to establish itself in your city. What is the company? Where will it be located (coordinates)?

**PART F:** The following retail locations have submitted applications to build stores in your city. Choose 4 of the following to locate in your city. Pick a location for each one at the intersection of 2 streets.

- |                        |                     |                         |
|------------------------|---------------------|-------------------------|
| Home Improvement Store | Electronics Store   | Wholesale Club Store    |
| Clothing Store         | Convenience Market  | Discount Clothing Store |
| Grocery                | Cell Phone Retailer | Toy Store               |
| Pharmacy               | Organic Grocery     | Art Gallery             |
| Gas Station            | Bakery              | Donut Shop              |

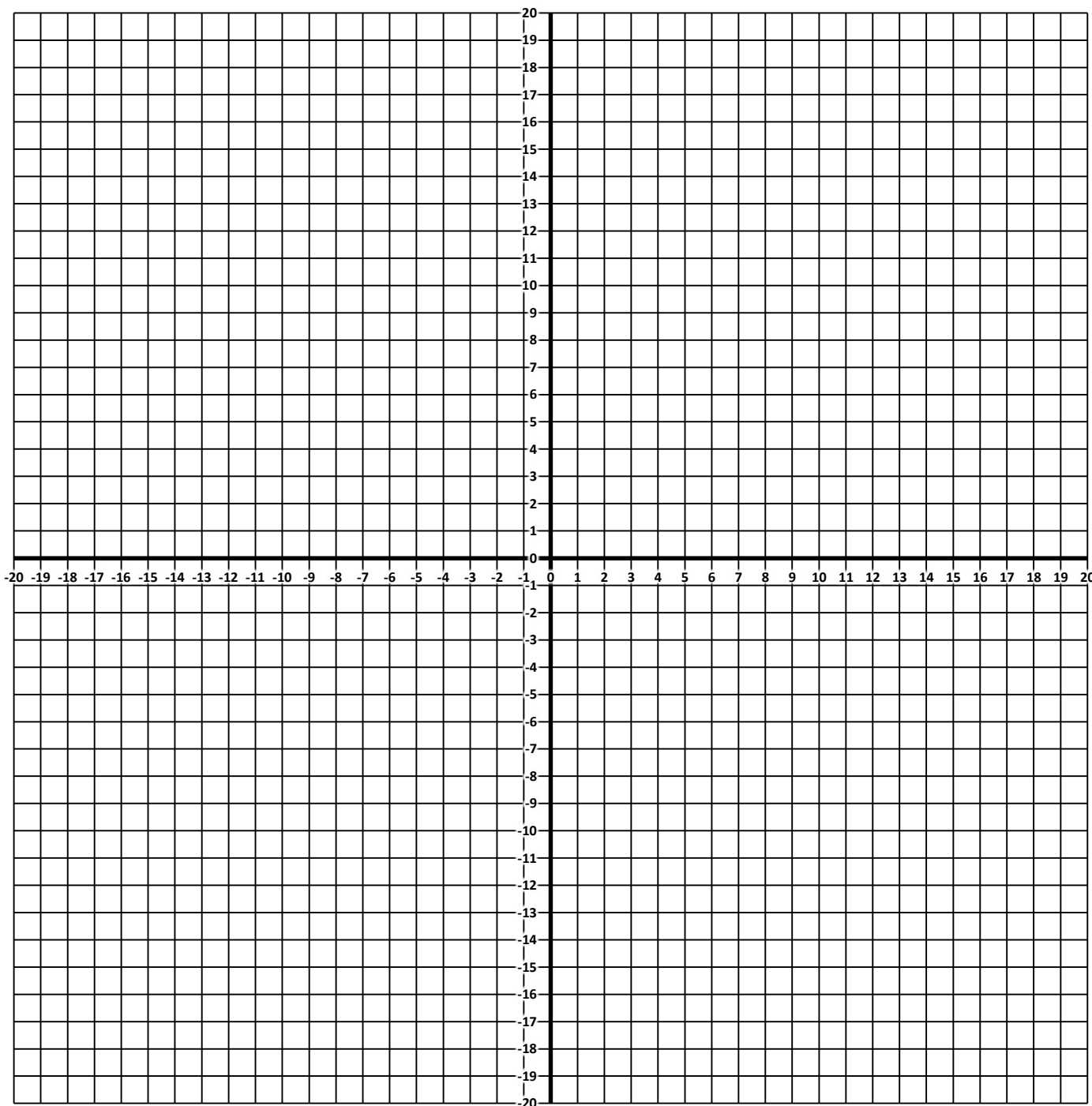
RETAILER	COORDINATES

2 restaurants will also locate in your city. What are the restaurants and where are they?

RESTAURANT	COORDINATES

**PART G:** How did planning your city relate to what you have learned about systems of equations?

**CITY:** \_\_\_\_\_



Name(s): \_\_\_\_\_

Rise over Run

# ANSWER GUIDE

Please note: Each city plan will turn out differently, and some answers will vary. The following answer guide will help you check student work. An example of a city plan follows, but it should not be used as an answer key.

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**Decide on a name for your city:** \_\_\_\_\_

**PART A:** Locate the following landmarks on a coordinate plane. (If you are creating your own, use graph paper, and draw the origin in the middle. The grid should extend 20 units in all directions.) Each unit on your paper will represent 0.1 of a mile. As you add features to your city throughout the activity, be sure to mark and label each one on your grid.

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- The only other paved road (1<sup>st</sup> Street) currently runs from the courthouse to the electric company.

*Note: During this activity, you may draw roads running through landmarks. Because your map has a small scale, roads and landmarks may appear to overlap when they are separated by several feet in distance in reality.*

Your city would like to attract tourists, so you will need a tourist center at the point where the main highway and 1<sup>st</sup> Street intersect. Where will the tourist center be located? **(-3, 8)**

**PART B:** Plan 4 new roads to run parallel to 1<sup>st</sup> Street. You should pick the locations thoughtfully, planning for where you think you will have traffic. Write the equations for these roads.

STREET NAME	EQUATION
<b>Answers will vary. All equations should be <math>y = 3x \pm</math> _____.</b>	

**PART C:** Now establish 5 additional roads to run perpendicular to 1<sup>st</sup> Street.

STREET NAME	EQUATION
<b>Answers will vary. All equations should be <math>y = -\frac{1}{3}x \pm</math> _____.</b>	

**PART D:** Will you need any bridges on these new streets? What coordinates will require bridges?

**Yes, answers will vary. Students should find the points where their roads intersect the river.**

**PART E:** Your city has funds to establish 4 of the following buildings/landmarks. Decide which 4 would be best for your city, and pick a location for each one. Add them to your map, and give their coordinates.

- |             |          |                |
|-------------|----------|----------------|
| Post Office | Arena    | Theme Park     |
| Park        | Hotel    | Police Station |
| Zoo         | Monument | Fire Station   |

BUILDING / LANDMARK	COORDINATES
<b>Answers will vary.</b>	

A large company has also decided to establish itself in your city. What is the company? Where will it be located (coordinates)?

**Answers will vary.**

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- |                        |                     |                         |
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RETAILER	COORDINATES
<b>Answers will vary.</b>	

2 restaurants will also locate in your city. What are the restaurants and where are they?

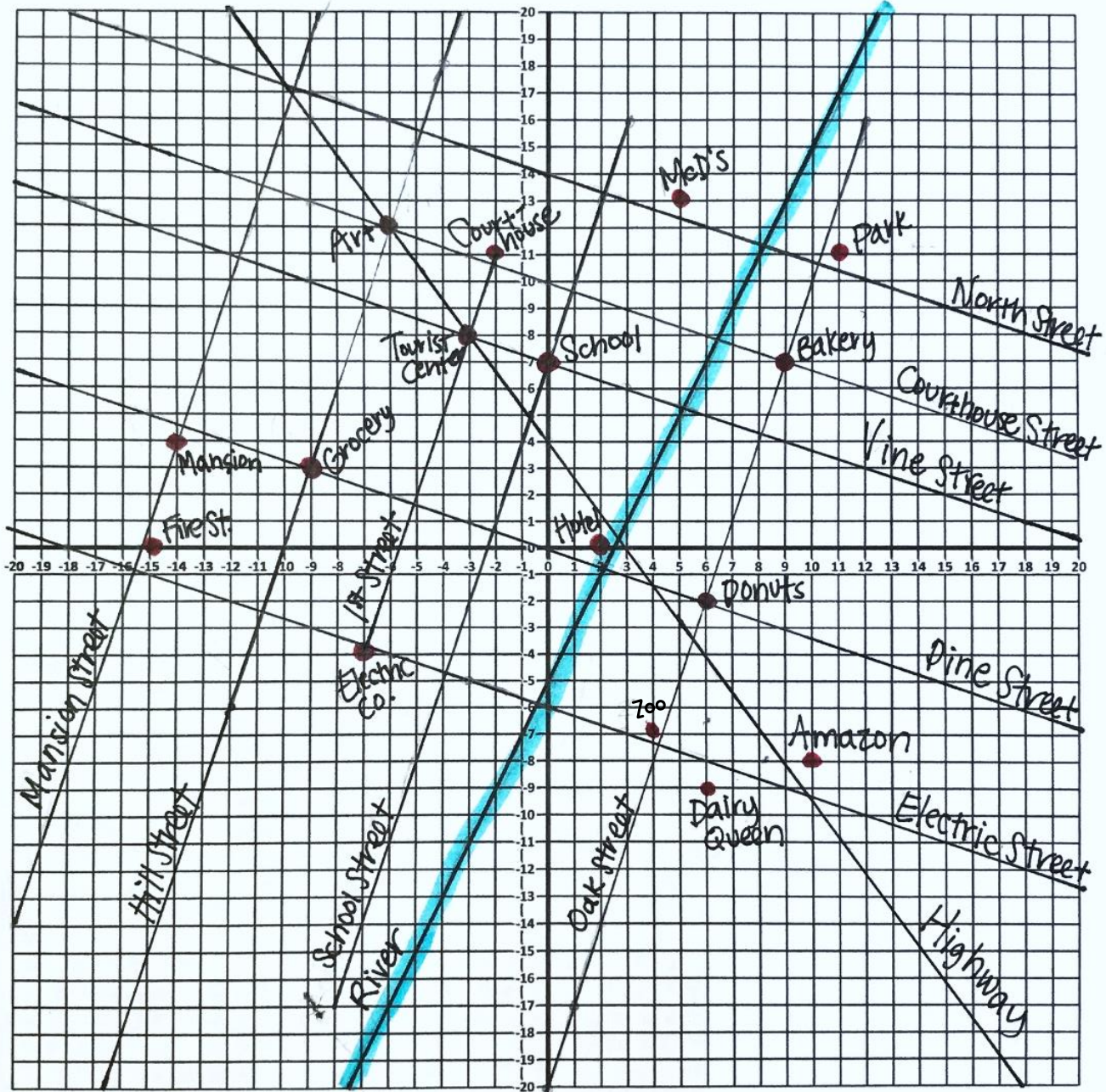
RESTAURANT	COORDINATES
<b>Answers will vary.</b>	

**PART G:** How did planning your city relate to what you have learned about systems of equations?

**Answers will vary. (The point where streets intersect is the solution to that system. Parallel streets never intersect. Etc.)**

# EXAMPLE OF CITY MAP

Note: This should not be used as an answer key. Locations of some streets and landmarks will vary. This also should not be shown to students while they are working because it does contain some answers.



Name \_\_\_\_\_

Grading Rubric

# PLANNING A CITY

	Excellent	Minor Error	Some Mistakes	Incomplete or Incorrect
Part A				
Part B				
Part C				
Part D				
Part E				
Part F				
Part G				
Neatness & Effort				

Name \_\_\_\_\_

Grading Rubric

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