# Goal 1: Functions & Algebra

## Linear Inequalities

| OBJECTIVE | CORE LEARNING GOALS |
|---|---|
| • Students will use technology to graph and evaluate linear inequalities.<br>• Students will write and manipulate inequalities for use on a graphing calculator.<br>• Students will use knowledge of intercepts to analyze inequalities. | 1.2.2 The student will solve linear inequalities and describe the solution using numbers, symbols, and/or graphs. |
| DRILL | MATERIALS<br>Student Worksheet<br>Extra Practice Problems<br>Answer Keys<br>Graphing calculators |

CALCULATOR SKILLS

- Entering and evaluating inequalities on a graphing calculator.
- Using the trace and intercept capabilities of the calculator.

ACTIVITIES

1. **Drill.**
2. **Evaluating Inequalities Using the Calculator –** Have students work in pairs to write an inequality for the given situation and solve the inequality in slope-intercept form.
3. **Exploration -** Students will enter the inequality into the calculator to get an appropriate picture of the situation. Students will answer questions using the calculator and mathematical reasoning about the inequality.
3. **Class Discussion** – Students will explain the mathematical knowledge used to answer various questions throughout the lesson.
4. **Additional problems –** These problems are provided for you to use in any one of a variety of ways such as homework, an individual check for understanding, review, or quiz. They are provided at the end of the lesson.

| ASSESSMENT | HOMEWORK |
|---|---|
| Class discussion | |

# Lilies and Daisies

## Lesson:

Engage students in content.

Elaine is planning a 40th birthday party for her mother. She has a maximum of $50 to spend on flowers. Her mother's favorite flowers are lilies and daises. How many of each could Elaine order if lilies cost $0.50 each and daisies cost $0.30 each?

1. Write an inequality to show the number of lilies (x) and daisies (y) Elaine could order staying under her $50 limit.

   Inequality: _____

2. Solve the inequality for y and then enter the inequality into your graphing calculator.

> Teacher Tips:
> Calculators vary in the way in which inequalities are graphed. You will need to read the manual of the model of calculator available to you and your students to assist them in graphing linear inequalities. This activity can be done without the aid of a graphing calculator; however using technology on the High School Assessment is encouraged.

3. List 3 possible combinations of lilies and daisies Elaine could order for her mother's 40th birthday party.

4. How many lilies could Elaine order if she decided not to include daisies in the flower arrangements? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

> Teacher Tip:
> Have the students find a zero for the inequality or they could use the trace function of the calculator.

5. How many daisies could Elaine order if she decided not to include lilies in the flower arrangements? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

> Teacher Tip:
> To find this value, students may find the corresponding y value when letting x be zero or may use the trace function of the calculator.

# Lilies and Daisies

## Student Worksheet:

Elaine is planning a 40th birthday party for her mother. She has a maximum of $50 to spend on flowers. Her mother's favorite flowers are lilies and daises. How many of each could Elaine order if lilies cost $0.50 each and daisies cost $0.30 each?

1. Write an inequality to show the number of lilies (x) and daisies (y) Elaine could order staying under her $50 limit.

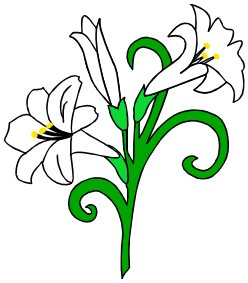
   Inequality: _____

2. Solve the inequality for y and then enter the inequality into your graphing calculator.

3. List three possible combinations of lilies and daisies Elaine could order for her mother's 40th birthday party.

4. If Elaine decided on only lilies, how many lilies could she order staying within her flower budget? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

5. If Elaine decided on only daisies, how many daisies could she order staying within her flower budget? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.



# Lilies and Daisies
# Answer Key

1. $0.5x + 0.3y \leq 50$

2. $y$ (-5/3) $x$ + (500/3)

3. Student answers will vary. Examples: (32, 75), (45, 50), (30, 100)

4. 100 lilies
   Example explanation: I found the x-intercept of the graph.

5. 166 daisies
   Example explanation: .5(0) + .3y 50
   .3y 50
   y 166.6667
   y 166 daisies

# Inequalities

## Extra Practice Items:

1. Benjamin has $5 to buy pizza and french fries. Pizza cost $1.25 a slice and french fries cost $1.10 per order.
    - Write an inequality that represents the number of slices of pizza and orders of french fries Benjamin can buy.
    - List 3 possible combinations of slices of pizza and orders of french fries Benjamin could buy. Use mathematics to justify your answer.

2. Baseball trading cards sell for $0.80 a pack and Pokemon cards sell for $3.60 a pack. Evon has $20.
    - List 3 possible combinations of baseball trading cards and Pokemon cards Evon could buy with her $20. Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

3. Kathy works at an optical store selling eyeglasses. Each week she earns $180 plus a 2% commission on her total sales for the week. Next week she wants to earn at least $350.
    - Write an inequality that represents the number of eyeglasses Kathy must sell to earn at least $350.
    - How many pairs of eyeglasses must Kathy sell to reach her goal of earning $350? Use mathematics to explain how you determined your answer. Use words, symbol, or both in your explanation.