

# EXTRA PRACTICE — Exercises

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## Unit IX – The Conic Sections

### Part F – Problem Solving With Non-Linear Systems

#### Lesson 1 – “Number” Problems

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For the following story problems, answer the four analysis questions to find the non-linear system needed to solve. Then solve and use common sense to check your answer.

1. Find the two negative numbers such that the sum of their squares is one hundred seventy, and twice the square of the first minus three times the square of the second is ninety-five.
2. The product of two numbers is ninety-six. The sum of their squares is two hundred eight. Find the numbers.
3. Find two positive integers whose sum is twelve, and the sum of their reciprocals is  $\frac{3}{8}$ .
4. The sum of two numbers is thirty-six, and their product is four. Find the sum of the reciprocals of the numbers.
5. The square of a certain number exceeds twice the square of another number by  $\frac{1}{8}$ . The sum of their squares is  $\frac{5}{16}$ . Find the numbers.

# EXTRA PRACTICE — Answer Key

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For the following story problems, answer the four analysis questions to find the non-linear system needed to solve. Then solve and use common sense to check your answer.

1. The numbers are  $-11$  and  $-7$ .

2. If  $y = 8$ , then  $x = 12$   
If  $y = -8$ , then  $x = -12$   
If  $y = 12$ , then  $x = 8$   
If  $y = -12$ , then  $x = -8$

3. If  $y = 8$ , then  $x = 4$

4. The two numbers are  $18 + 8\sqrt{5}$   $18 - 8\sqrt{5}$

5.  $\frac{1}{2}, \frac{1}{4}$   $\frac{1}{2}, -\frac{1}{4}$   $-\frac{1}{2}, \frac{1}{4}$   $-\frac{1}{2}, -\frac{1}{4}$