

**LESSON 7.5 Skills Practice**


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Name \_\_\_\_\_ Date \_\_\_\_\_

**The Breaking Point**  
**Using Rational Functions to Solve Problems**
**Problem Set**

Solve each problem. Explain your reasoning.

1. Courtney plays softball. Her goal for the season is to have an overall batting average of 0.300 or better. Currently she has 45 base hits in 150 at bats. How many consecutive base hits must she get to reach her goal?

Courtney must get at least 8 consecutive hits to reach her goal. The ratio of her hits to her at bats

is  $\frac{40}{150}$ . Additional hits increases the numerator as well as the denominator, represented by the

ratio  $\frac{40+x}{150+x}$ . The result of graphing the functions  $y = \frac{40+x}{150+x}$  and  $y = 0.300$  and finding their

point of intersection provides the solution.

2. Tito is mixing green and red paint. Currently his mixture is 3 parts green to 5 parts red. What is the least amount of red paint Tito needs to add so that the mixture is in the ratio 1 part green to 6 parts red?

3. Talk-Tell is a cellular service provider. They advertise that you can buy a monthly plan for as low as \$75 per month as long as you buy a cell phone costing \$200. If you buy the monthly plan along with the phone, how many months will it take for your average cost of owning the phone and the plan to be less than \$90?

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4. Mr. Motley is tweaking the final exam he intends to give to his Algebra 2 students. The current test has 10 multiple choice and 7 free response questions. He would like that ratio of multiple choice to free response questions to be 2:3. How many free response questions does Mr. Motley need to add to his test to achieve the desired ratio?
5. Ms. Greenery owns a lawn service company. She placed the following flyer in the mailboxes of everyone living in the town of Stork.

|                                |
|--------------------------------|
| Greenery Lawn Service          |
| • One-time fee \$150           |
| • Monthly application fee \$25 |

If you purchase Ms. Greenery's service, how many months will it take for your average monthly cost for the service to be less than \$75?

6. Conroy is a budding entomologist, that means that he likes to study insects. In fact, Conroy has an insect collection that currently contains 30 insects that fly and 45 insects that crawl. He would like his collection to contain enough insects so that the ratio of the number of insects that fly to the number of insects that crawl is 1:2. How many insects that crawl should Conroy add to his collection to achieve the desired ratio?

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7. Upon entering Sly's Long Term Rentals one is greeted by the following two signs.

| Big Deal                  | Not So Big Deal            |
|---------------------------|----------------------------|
| 60" HD Television         | 60" HD Television          |
| • \$300 Deposit           | • \$100 Deposit            |
| • \$80 Monthly Rental Fee | • \$120 Monthly Rental Fee |

Determine the number of months for which the average monthly cost for the Not So Big Deal is better than the average monthly cost for the Big Deal.

8. Milton and Tory both work at Widget Kingdom, a company that produces widgets. Milton is paid \$112 a day plus \$0.10 for each widget he produces; while Tory is paid \$96 a day plus \$0.15 for each widget she produces. If Milton and Tory consistently produce the same number of widgets, at what point will the average cost of a widget produced by Tory be greater than the average cost of a widget produced by Milton?

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9. Cody and Melissa play on the same basketball team. Up to this point in the season Cody has made 19 out of 30 free throw attempts for an average of about 63.33%; while Melissa has made 10 out of 25 free throw attempts for an average of 40%. Suppose that during the balance of the basketball season Melissa shoots twice as many free throws as Cody and both Melissa and Cody make all of them. If at the end of the season they both end up with the same free throw average, what is the least number of free throws made by Cody during the balance of the season?
10. Condoleezza works from home 6 hours per day 5 days a week. The company she works for pays her \$22 per hour plus \$5 for every prospective customer she contacts who signs up for the service provided by the company. The company will continue to employ Condoleezza provided she can maintain an average weekly cost per new customer that is less than or equal to \$7. How many new customers per week must Condoleezza sign up for the company's service to be able to keep her job?

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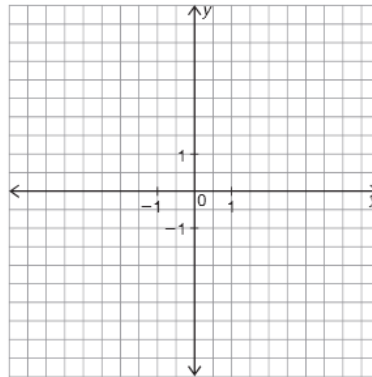
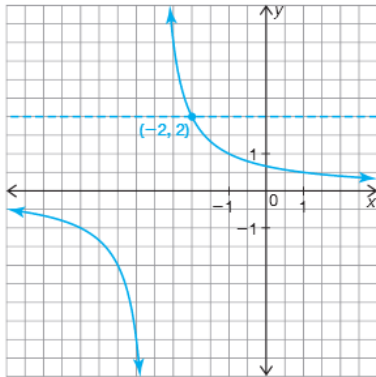
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Sketch a graph to solve each equation. Do not use a graphing calculator.

11.  $\frac{2}{x+3} = 2$

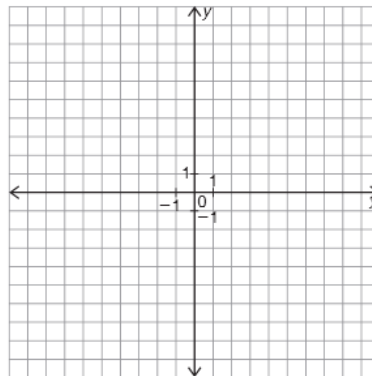
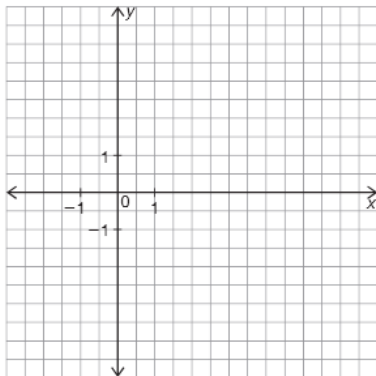
12.  $\frac{x+1}{x} = 0$



$x = -2$

13.  $\frac{x-2}{x-3} = 2$

14.  $\frac{5x}{x-1} = 4$

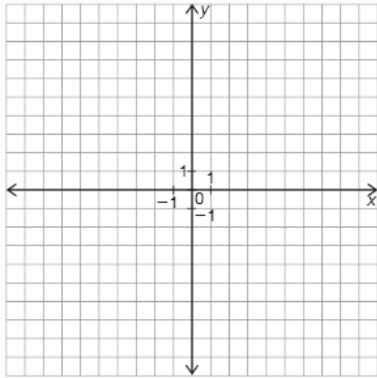


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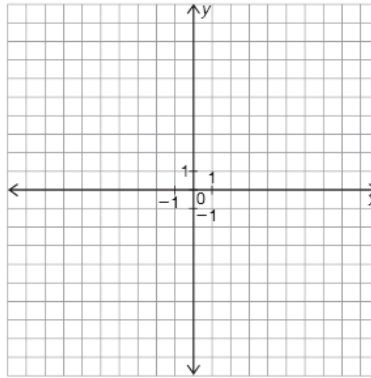
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15.  $\frac{x^2 - 9}{x - 3} = -2$



16.  $\frac{2x}{x + 2} = 6$



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