PRACTICE & PROBLEM SOLVING

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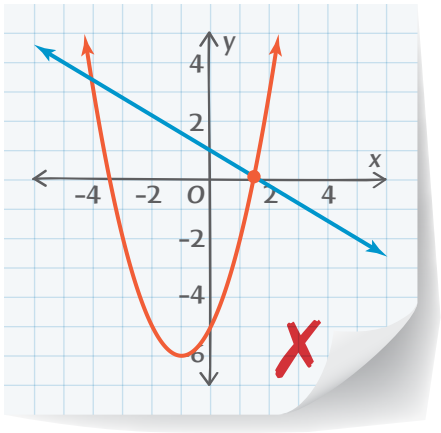
Practice Tutorial

Additional Exercises Available Online

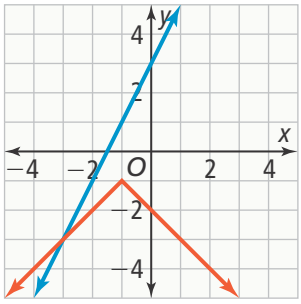
UNDERSTAND

5. Construct Arguments Use a graph to solve the equation $3x - 5 = 2 + 3x$. How can you use algebra to confirm that your graph shows the correct solution?

6. Error Analysis Victor graphed the equation $x^2 + 2x - 5 = -0.6x + 1$. He used the INTERSECT feature on his graphing calculator to find the solution. Victor said one of the solutions is $x \approx 0.116$. Describe and correct the error Victor made.



7. Higher Order Thinking Sadie used a graph to solve an equation. What equation did Sadie solve? Explain how to verify your equation is correct.



8. Communicate Precisely Explain how to use the table to find the approximate solution to the equation $f(x) = g(x)$.

x	$f(x)$	$g(x)$
1.1426	1.8556	1.857175
1.1427	1.8562	1.8571625
1.1428	1.8568	1.85715
1.1429	1.8574	1.8571375
1.1430	1.858	1.857125

PRACTICE

Use a graph to solve each equation. SEE EXAMPLE 1

9. $-x + 4 = 2$

10. $|x - 4| - 4 = \frac{1}{2}x$

11. $3x + 2 = x + 4$

12. $-\frac{1}{4}x + 6 = \frac{1}{2}x + 3$

13. $\frac{3}{4}x = 2x - 10$

14. $|x + 8| = |x - 2|$

Use a graph to solve each inequality. SEE EXAMPLE 2

15. $x^2 - 7x - 8 > 0$

16. $x - 5 > -2x + 4$

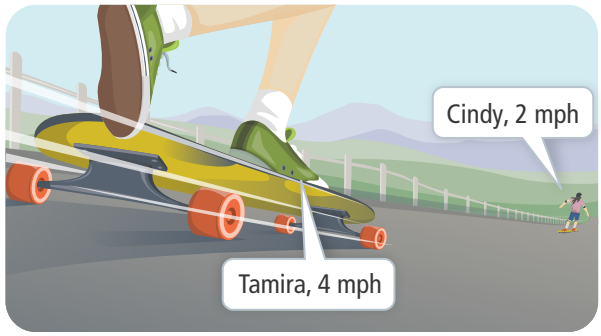
17. $x^2 + x - 6 < 0$

18. $x^2 + 2x - 8 \leq 0$

19. $-x^2 - 2x + 15 \leq 0$

20. $-x + 5 < \frac{1}{2}x - 1$

21. Cindy is longboarding 6 mi ahead of Tamira. Cindy is traveling at an average rate of 2 mph. Tamira is traveling at a rate of 4 mph. Let x represent the number of hours since Tamira started longboarding. Write an inequality to represent this situation. When will Tamira be ahead of Cindy?



Use a graph and tables to solve the equation. SEE EXAMPLE 3

22. $x^2 - 8x + 5 = x + 3$

23. $\frac{1}{4}x + 3 = x^2 - x + 2$

24. $2x^2 - 5 = -x^2 + 2x - 1$

25. $3x - 4 = \frac{1}{2}|x - 5|$

Use graphing technology to approximate the solutions of the equation to the nearest tenth. SEE EXAMPLE 4

26. $x^2 + 6x - 8 = |x - 1| + 3$

27. $|x + 2| - 6 = x^2 - 7x - 2$

28. $\frac{1}{5}|x + 2| - 3 = -|x - 1| + 5$

29. $x^2 + 3x - 7 = -2x^2 - 6x + 9$

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Mixed Review Available Online

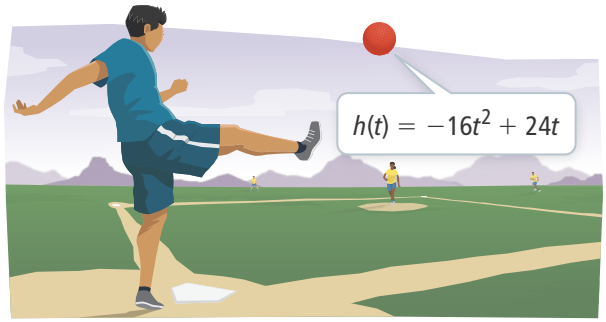
APPLY

30. Reason Jack is running 2.45 mi ahead of Zhang. Jack is running at an average rate of 5.5 mph. Zhang is running at a rate of 7.75 mph. Let x represent the number of hours since Zhang started jogging.

a. Write an inequality to represent this situation.

b. Use graphing technology to find when Zhang will be ahead of Jack. Round to the nearest hundredth.

31. Use Structure In a kickball game, a ball is kicked and travels along a parabolic path. The height h, in feet, of the kickball t seconds after the kick can be modeled by the equation $h(t) = -16t^2 + 24t$.



a. A fielder runs a route that will allow him to catch the kickball at about 3 ft above the ground. Write an equation that can be used to find when the fielder will catch the ball.

b. Use graphing technology to find out how long the kickball has been in the air when the fielder catches it. Round to the nearest hundredth.

32. Make Sense and Persevere The amount, in millions of dollars, that a company earns in revenue for selling x items, in thousands, is $R = -2x^2 + 18x - 2$. The expenses, in millions of dollars, for selling x items, in thousands, is $E = -0.25x + 6$.

a. The profit P, in millions of dollars, for selling x items, in thousands, is the difference between the revenues and the expenses. Write an inequality that models the company earning a profit.

b. Use graphing technology to find how many items the company must sell to earn a profit. Round to the nearest item.

ASSESSMENT PRACTICE

33. Graph the equation $x^2 - 3 = x + 3$. What are the solutions to the equation?

34. SAT/ACT A graph shows the solution to the equation $-\frac{1}{2}x + \frac{7}{2} = -x + a$ is $x = -1$. What is the value of a?

Ⓐ -3

Ⓑ -2

Ⓒ 1

Ⓓ 2

Ⓔ 3

35. Performance Task Deondra is using a coordinate grid to model her backyard. She wants to mark an area in her backyard to plant a garden. She decides the center of her garden will be located at the origin on her coordinate grid. She models the area of her garden on the coordinate grid with the inequality $-\frac{1}{2}|x| + 5 \geq \frac{1}{2}|x| - 5$.

Part A Graph the inequality that models the area of Deondra's garden on the coordinate grid.

Part B What shape is Deondra's garden?

Part C Deondra wants to cover her garden with garden soil. She wants the soil to be $\frac{1}{2}$ ft deep. If each unit on the coordinate grid represents 1 ft^2, how much garden soil will Deondra need?

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