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The Playoffs
Graphing Inequalities

Vocabulary

Define the term in your own words

1. half-plane

Problem Set

Write a linear inequality in two variables to represent each problem situation.

1. Tanya is baking zucchini muffins and pumpkin muffins for a school event. She needs at least 500 muffins for the event.

   $x + y \geq 500$

2. Hiro needs to buy new pens and pencils for school. Pencils cost $1 each and pens cost $2.50 each. He has $10 to spend.

3. Patti makes decorative flower pots. It costs her $20 to purchase the materials for each pot. She wants to charge more than $6 per hour of labor plus her materials cost for each pot.

4. Jose and Devon are working on a construction job together. Devon can put in 4 times as many hours per week as Jose. Together they must work at least 80 hours per week.

5. The Foxes are playing the Titans. The Titans have been scoring 28 or more points per game this season. Between 7-point touchdowns and 3-point field goals, the Foxes need to score more than the Titan's lowest score to have a hope of winning the game.

6. Jack made twice his fundraising goal, which was less than the total that Cameron raised. Cameron raised $14 more than 5 times her goal.

Tell whether the graph of each linear inequality will have a dashed line or a solid line. Explain your reasoning.

7. $x - 3y \leq 32$

The line will be solid because the symbol is $\leq$.

8. $8y + 7x > 15$

9. $y < 14x + 9$

10. $-5.2y - 8.3x \leq -28.6$

11. $\frac{2}{3}x + \frac{4}{9}y \geq 3$

12. $y - 17 > x + 8$

13. $185x + 274y \geq 65$

14. $36 < 9y - 2x$

For each inequality, use the test point (0, 0) to determine which half-plane should be shaded.

15. $5x + 7y > -13$

$5(0) + 7(0) > -13$

$0 > -13$

The half-plane that includes (0, 0) should be shaded because the inequality is true for that point.

16. $y - 30 \leq 9x$

17. $-8y > 6x + 12$

18. $46 \geq -5y + 10x$

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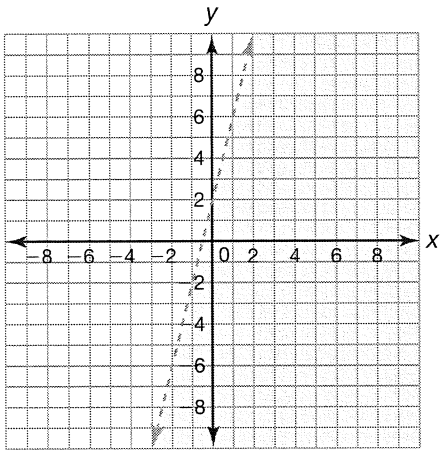
19. $31.9x + 63.7y < -44.5$

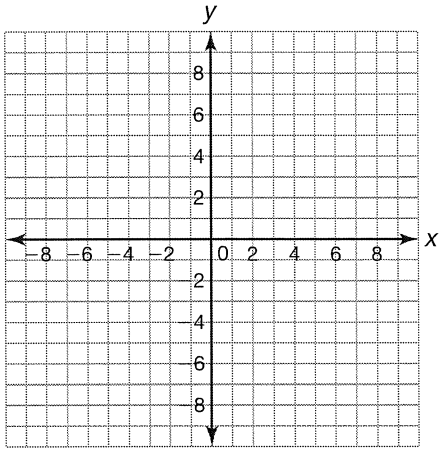
20. $y - \frac{5}{6} > \frac{1}{2}x + \frac{1}{3}$

Graph each linear inequality.

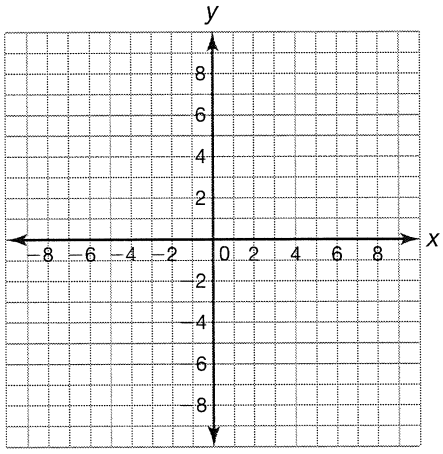
21. $y < 4x + 2$



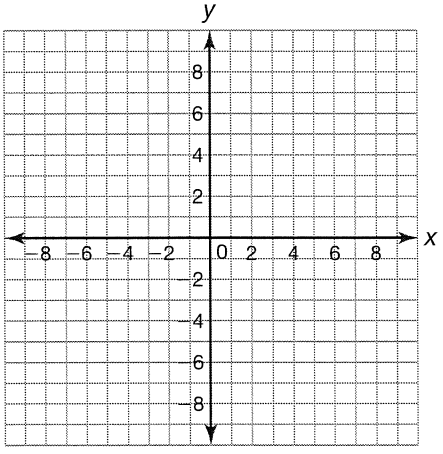
22. $y \geq 10 - x$



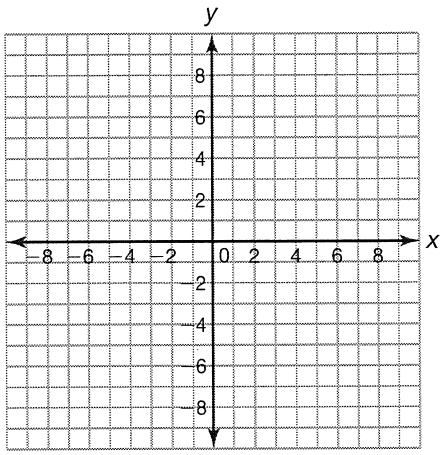
23. $y \geq \frac{1}{2}x - 3$



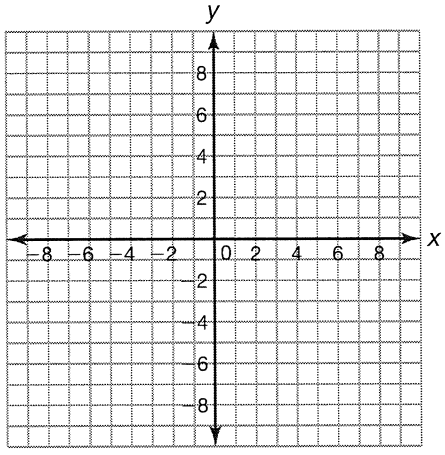
24. $-x + y > 1$



25. $3x - 4y \geq 8$



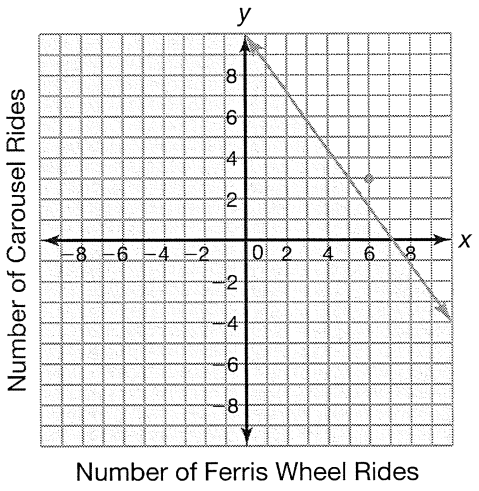
26. $\frac{3}{8}y - \frac{1}{4}x < \frac{3}{4}$



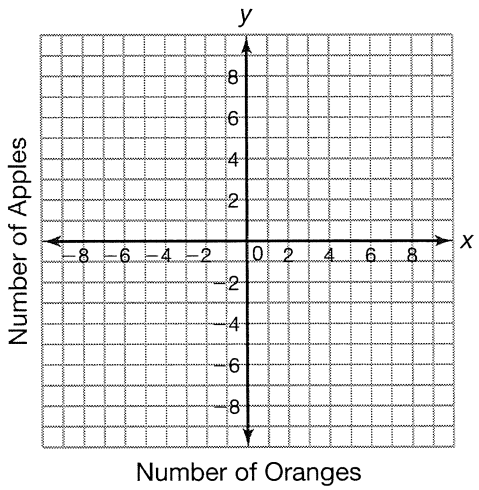
Graph each inequality and determine if the ordered pair is a solution for the problem situation.

27. Marcus has 50 tokens to spend at the school carnival. The Ferris wheel costs 7 tokens and the carousel costs 5 tokens. The inequality $7x + 5y \leq 50$ represents the possible ways Marcus could use his tokens on the two rides. Is the ordered pair (6, 3) a solution for the problem situation?

No. The ordered pair (6, 3) is not a solution to the inequality. It is not in the shaded half-plane.



28. Sophia has \$2 to buy oranges and apples. Oranges cost \$0.45 each and apples cost \$0.25 each. The inequality $0.45x + 0.25y \leq 2$ represents the possible ways Sophia could spend her \$2. Is the ordered pair (2, 3) a solution for the problem situation?



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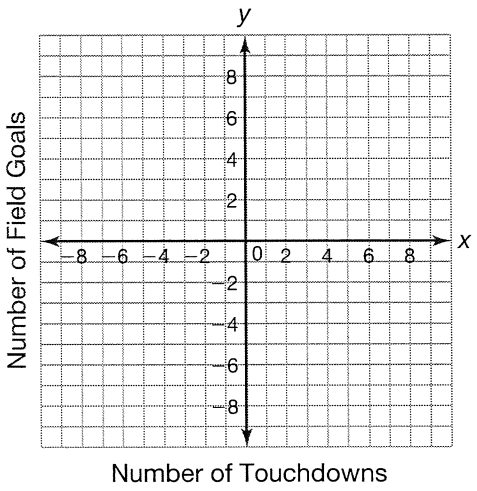
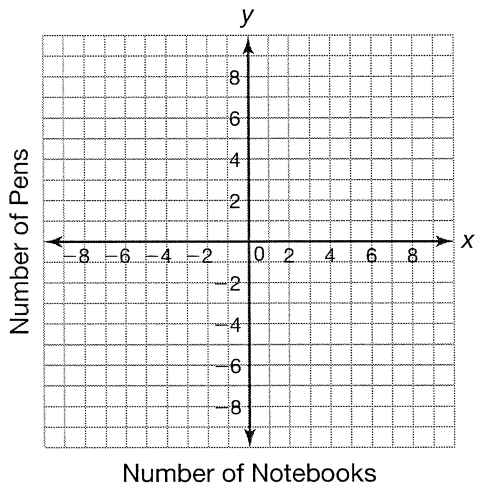
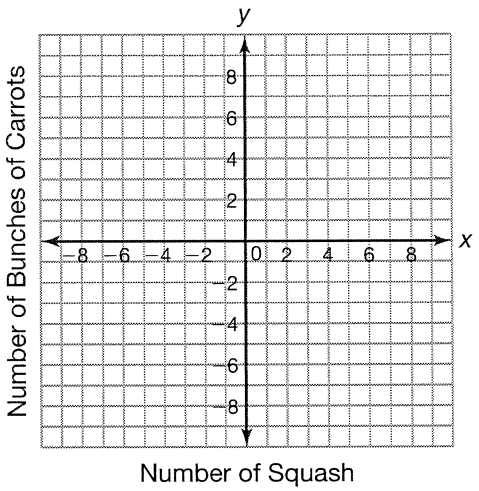
29. Noah plays football. His team's goal is to score at least 15 points per game. A touchdown is worth 6 points and a field goal is worth 3 points. Noah's league does not allow teams to try for the extra point after a touchdown. The inequality $6x + 3y \geq 15$ represents the possible ways Noah's team could score points to reach their goal. Is the ordered pair $(6, -1)$ a solution for the problem situation?



30. Lea has \$5 to buy notebooks and pens. Notebooks cost \$1.25 each and pens cost \$0.75 each. The inequality $1.25x + 0.75y \leq 5$ represents the possible ways Lea could spend her \$5. Is the ordered pair $(5, 2)$ a solution for the problem situation?



31. Leon has \$10 to buy squash and carrots. Squash cost \$1.50 each and carrots cost \$2.75 per bunch. The inequality $1.50x + 2.75y \leq 10$ represents the possible ways Leon could spend his \$10. Is the ordered pair $(-2, 4)$ a solution for the problem situation?



32. Olivia makes and sells muffins and scones at a school bake sale. She sells muffins for \$0.50 each and scones for \$0.80 each. She hopes to raise at least \$20. The inequality $0.50x + 0.80y \geq 20$ represents the possible ways Olivia could reach her goal. Is the ordered pair (20, 32) a solution for the problem situation?