3-4 Solve Multistep Inequalities

Name _____ Date _____

Solve: $4.22 + 1.2g \geq 5.1 + 3.4g$

$\mathbf{100}(4.22 + 1.2g) \geq \mathbf{100}(5.1 + 3.4g)$ ← Multiply both sides by 100

$\mathbf{422} + \mathbf{120}g \geq \mathbf{510} + \mathbf{340}g$

$422 + 120g \mathbf{- 120}g \geq 510 + 340g \mathbf{- 120}g$ ← Use the Subtraction Property of Inequality.

$422 \geq 510 + \mathbf{220}g$

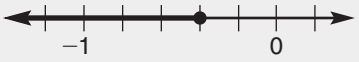
$422 \mathbf{- 510} \geq 510 \mathbf{- 510} + 220g$ ← Use the Subtraction Property of Inequality.

$\mathbf{-88} \geq 220g$

$\frac{-88}{\mathbf{220}} \geq \frac{220g}{\mathbf{220}}$ ← Use the Division Property of Inequality.

$-0.4 \geq g$

Graph: $\{g \mid g \leq -0.4\}$ or $(-\infty, -0.4]$



Check: Try $g = -1$.

$4.22 + 1.2(-1) \stackrel{?}{\geq} 5.1 + 3.4(-1)$

$4.22 \mathbf{- 1.2} \stackrel{?}{\geq} 5.1 \mathbf{- 3.4}$

$3.02 \geq 1.7$ **True**

Remember: When graphing a solution set that does not include a boundary point, place a *circle* at the point. Otherwise, place a *dot* at the point.

Solve each inequality. Write the solution in set-builder and interval notation. On a separate sheet of paper, graph and check the solution set.

1. $\frac{1}{2} + \frac{2}{3}b \geq \frac{5}{6}$

LCD of 2, 3, and 6 = 6

$\mathbf{6}\left(\frac{\mathbf{1}}{\mathbf{2}} + \frac{\mathbf{2}}{\mathbf{3}}b\right) \geq \mathbf{6}\left(\frac{\mathbf{5}}{\mathbf{6}}\right)$

$\mathbf{3 + 4}b \geq \mathbf{5}$

$\mathbf{3 - 3 + 4}b \geq \mathbf{5 - 3}$

$\mathbf{4}b \geq \mathbf{2}$

$\frac{\mathbf{4}b}{\mathbf{4}} \geq \frac{\mathbf{2}}{\mathbf{4}}$

$b \geq \frac{1}{2}$; $\left\{b \mid b \geq \frac{1}{2}\right\}$; $\left[\frac{1}{2}, \infty\right)$

2. $\frac{2}{3} + \frac{3}{4}c \geq \frac{7}{12}$

3. $\frac{7}{5} - \frac{3}{10}f \leq \frac{3}{5}$

4. $\frac{9}{8} - \frac{3}{2}m \leq \frac{1}{4}$

5. $\frac{3}{4} > \frac{2}{3}n - \frac{11}{12}$

6. $\frac{7}{2} > \frac{8}{3}j - \frac{7}{6}$

7. $3 - 1.5y < 5.4 - 2.7y$

8. $2 - 2.9h < 8.3 - 3.8h$

9. $5.26 - 2.4c \geq 20.59 + 4.9c$

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Solve each inequality. Write the solution in set-builder and interval notation. Check to justify your work.

10. $-6 \geq 11 - 4a + 3$

$-6 \geq 14 - 4a$

$-20 \geq -4a$

$5 \leq a$ or $a \geq 5$

$\{a \mid a \geq 5\}$; $[5, \infty)$

Check: $-6 \stackrel{?}{>} 11 - 4(6) + 3$

$-6 > -10$ True

11. $-5 \geq 7 - 8t + 12$

12. $4 > -2 + 3r + 8$

13. $10b > -8 + 5b + 3$

14. $15 - 2n - 20 < -11n$

15. $9 - 3s + 15 \leq -6s$

16. $3(y - 4) \geq 18$

17. $7(x + 5) \geq -7$

18. $6(w - 2) + 3w < 6$

19. $4(g - 7) + 8g < 8$

20. $9(q - 2) - 11q \leq 7$

21. $5(h + 3) - 9h \leq -3$

Problem Solving

22. Juan scored 15 points more on this test than on his previous test. If the average of the two tests is at least 92 and both scores are integers, what are the least scores he could have had on the two tests?

23. A store sells khakis for \$19.99 and boots for \$51.99. It is having a 35%-off sale. Jeanie needs a new pair of boots, plans to spend \$20 at lunch, and only has \$150 with her. How many pairs of khakis could Jeanie buy? Suppose sales tax is 6%.

MENTAL MATH

24. 15(23)

25. 28(40)

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