

I. Solve each inequality. Graph on a number line and write your answer in interval notation.

1. $6 + a \leq 12$
 $a \leq 6$
 $(-\infty, 6]$

2. $4r - 6 - 9r - 5 \geq 29$
 $-5r \geq 40$
 $r \leq -8$
 $(-\infty, -8]$

3. $5(4a - 3) < 2(10a - 1)$
 $20a - 15 < 20a - 2$
 $0 < 13$
 $\mathbb{R} (-\infty, \infty)$

4. $\left(\frac{q}{2} - 5 > -6 + \frac{2q}{3}\right) \cdot 6$
 $3q - 30 > -36 + 4q$
 $6 > q$
 $(-\infty, 6)$

5. $-5x + 23 < 23$
 $-5x < 0$
 $x > 0$
 $(0, \infty)$

6. $5p - 6 - 3p \geq -16$
 $2p \geq -10$
 $p \geq -5$
 $[-5, \infty)$

7. $\left(\frac{2}{3}f - 4 \leq 5 + \frac{1}{6}f\right) \cdot 6$
 $4f - 24 \leq 30 + f$
 $3f \leq 54$
 $f \leq 18$
 $(-\infty, 18]$

8. $4g(5 + 3g) - 2 \leq 6g(2g + 3) + 1$
 $20g + 12g^2 - 2 \leq 12g^2 + 18g + 1$
 $2g \leq 3$
 $g \leq \frac{3}{2}$
 $(-\infty, \frac{3}{2}]$

9. $\left(\frac{5}{4}(8m - 24) < \frac{4}{3}(9m - 27)\right) \cdot 12$
 $15(8m - 24) < 16(9m - 27)$
 $120m - 360 < 144m - 432$
 $72 < 24m$
 $3 < m$
 $(3, \infty)$

10. $3a + 8 < 14$ OR $5 - 6a \leq 17$
 $3a < 6$ OR $-6a \leq 12$
 $a < 2$ OR $a \geq -2$
 $\mathbb{R} (-\infty, \infty)$

11. $12x + 8 > 7x - 7$ AND $2x + 8 \geq 4x - 6$
 $5x > -15$ AND $14 \geq 2x$
 $x > -3$ AND $7 \geq x$
 $(-3, 7]$

12. $15h - 9 < 9 - 6h$ AND $3h + 8 < 5h - 12$
 $21h < 18$ AND $20 < 2h$
 $h < \frac{6}{7}$ AND $10 < h$
 \emptyset

13. $-3 \leq 2 + 5t \leq 27$
 $-5 \leq 5t \leq 25$
 $-1 \leq t \leq 5$
 $[-1, 5]$

14. $6 - 7b \leq -15$ OR $5b + 3 \leq 13$
 $-7b \leq -21$ OR $5b \leq 10$
 $b \geq 3$ OR $b \leq 2$
 $(-\infty, 2] \cup [3, \infty)$

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II. Without graphing, write each inequality in interval notation.

15. $-4 < x \leq 7$

$(-4, 7]$

16. $x \geq 8$

$[8, \infty)$

17. $9 > x$ $x < 9$

$(-\infty, 9)$

18. $-7 \geq x$ $x \leq -7$

~~$(-\infty, -7)$~~
 $(-\infty, -7]$

III. Without graphing, write each interval as an inequality.

19. $(-5, 8]$

$-5 < x \leq 8$

20. $(-\infty, 5]$

$x \leq 5$

21. $(25, \infty)$

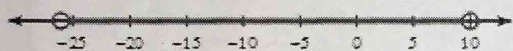
$x > 25$

22. $[3, 11)$

$3 \leq x < 11$

IV. Write an inequality AND interval notation given each graph.

23.



$-25 < x < 10$
 $(-25, 10)$

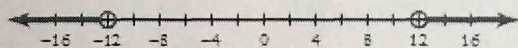
$-26 < x < 10$
 $(-26, 10)$ ★

24.



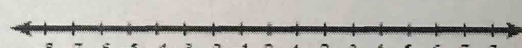
$-3 < x < -1$
 $(-3, -1)$

25.



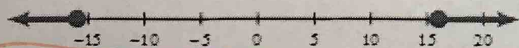
$x < -12$ or $x > 12$
 $(-\infty, -12) \cup (12, \infty)$

26.



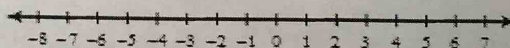
\mathbb{R}
 $(-\infty, \infty)$

27.



$x \leq -16$ or $x \geq 16$
 $(-\infty, -16] \cup [16, \infty)$

28.



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