

15 Inequalities Ex 11

- ① $2x+1 > 7$
 $2x > 7-1$
 $2x > 6$
 $x > 6/2$
 $x > 3$
- ② $x > 3$
- ③ $x > 4$
- ④ $y \geq -4$
- ⑤ $2y+3 > 3$
 $2y > 3-3$
 $2y > 0$
 $y > 0$
- ⑥ $5y-1 \geq -11$
 $5y \geq -11+1$
 $5y \geq -10$
 $y \geq -10/5$
 $y \geq -2$
- ⑦ $x > 3$
- ⑧ $x > 10$
- ⑨ $x < 4$
- ⑩ $y \leq 6$
- ⑪ $y \leq 0$
- ⑫ $y \geq 7$
- ⑬ $3t+4 > 2$
 $3t > 2-4$
 $3t > -2$
 $t > -2/3$
- ⑭ $u < -11/6$
- ⑮ $v > -16/3$
- ⑯ $w \leq -35/5$
- ⑰ $x \geq -3/2$
- ⑱ $y \leq -26/4$
- ⑲ $x > 7/2$
- ⑳ $x < 6/5$
- ㉑ $x \geq 3$
- ㉒ $2(5x-4) \leq 27$
 $10x-8 \leq 27$
 $10x \leq 27+8$
 $10x \leq 35$
 $x \leq 3.5$
- ㉓ $12x+8 < 38$
 $12x < 30$
 $x < 30/12$
 $x < 5/2$
- ㉔ $5x+10 > 25$
 $5x > 15$
 $x > 3$

$$(25) \quad 8\left(x - \frac{1}{2}\right) < 20$$

$$\begin{aligned} 8x - 4 &< 20 \\ 8x &< 20 + 4 \\ 8x &< 24 \\ x &< \frac{24}{8} \\ x &< 3 \end{aligned}$$

$$(26) \quad 6\left(2x - \frac{1}{2}\right) \geq 15$$

$$\begin{aligned} 12x - 3 &\geq 15 \\ 12x &\geq 15 + 3 \\ 12x &\geq 18 \\ x &\geq \frac{18}{12} \\ x &\geq \frac{3}{2} \end{aligned}$$

(Pg 2)

$$(27) \quad 12x + 21 < 69$$

$$\begin{aligned} 12x &< 48 \\ x &< 4 \end{aligned}$$

$$(28) \quad 9x + 18 > 63$$

$$\begin{aligned} 9x &> 45 \\ x &> 5 \end{aligned}$$

$$(29) \quad 3x + 4 \leq 10$$

$$\begin{aligned} 3x &\leq 6 \\ x &\leq 2 \end{aligned}$$

$$(30) \quad 2x - 3 > 1$$

$$\begin{aligned} 2x &> 4 \\ x &> 2 \end{aligned}$$

Ex 2

$$(1) \quad 4x - 1 \geq x + 8$$

$$\begin{aligned} 4x - x &\geq 8 + 1 \\ 3x &\geq 9 \\ x &\geq \frac{9}{3} \\ x &\geq 3 \end{aligned}$$

$$(2) \quad 9x + 4 < 5x - 8$$

$$\begin{aligned} 9x - 5x &< -8 - 4 \\ 4x &< -12 \\ x &< \frac{-12}{4} \\ x &< -3 \end{aligned}$$

$$(3) \quad 5q - 3q < 24 - 6$$

$$\begin{aligned} 2q &< 18 \\ q &< 9 \end{aligned}$$

$$(4) \quad 7r - 3r > 13 + 3$$

$$\begin{aligned} 4r &> 16 \\ r &> 4 \end{aligned}$$

$$(5) \quad 3s + s \geq 13 - 1$$

$$\begin{aligned} 4s &\geq 12 \\ s &\geq 3 \end{aligned}$$

$$(6) \quad 3s + s \geq 13 - 1$$

$$\begin{aligned} 4s &\geq 12 \\ s &\geq 3 \quad (\text{same as (5)!}) \end{aligned}$$

(194)

$$\textcircled{17} 4(3x+2) - 3(2x-1) > 3x+2$$

$$12x+8-6x+3 > 3x+2$$

$$12x-6x-3x > 2-8-3$$

$$3x > -9$$

$$x > -9/3$$

$$x > -3$$

$$\textcircled{18} 2(5x-1) - 4(x-3) < x+5$$

$$10x-2-4x+12 < x+5$$

$$10x-4x-x < 5+2-12$$

$$5x < -5$$

$$x < -1$$

$$\textcircled{19} 5x+15 \geq 4x+10$$

$$5x-4x \geq 10-15$$

$$x \geq -5$$

$$\textcircled{20} 3(2x+1) + 2(x-4) > 3(x-5)$$

$$6x+3+2x-8 > 3x-15$$

$$6x+2x-3x > -15-3+8$$

$$5x > -10$$

$$x > -10/5$$

$$x > -2$$

$$(7) 3t + 2t \leq 13 + 2$$

$$5t \leq 15$$

$$t \leq 3$$

$$(8) 4 + 3u \geq 24 - 4$$

$$4u \geq 20$$

$$u \geq 5$$

(Pg 3)

$$(9) 6(2p - 1) - 5 \geq -23$$

$$12p - 6 - 5 \geq -23$$

$$12p \geq -23 + 6 + 5$$

$$12p \geq -12$$

$$p \geq -1$$

$$(10) 5(2z - 1) + 4 \leq 29$$

$$10z - 5 + 4 \leq 29$$

$$10z \leq 29 + 5 - 4$$

$$10z \leq 30$$

$$z \leq 3$$

$$(11) 2x + 2 + 3 \geq 15$$

$$2x \geq 15 - 2 - 3$$

$$2x \geq 10$$

$$x \geq 5$$

$$(12) 3y + 15 - 4 < 29$$

$$3y < 29 - 15 + 4$$

$$3y < 18$$

$$y < 6$$

$$(13) 3x + 12 - 3 \geq 5x - 15$$

$$12 - 3 + 15 \geq 5x - 3x$$

$$24 \geq 2x$$

$$12 \geq x$$

$$\text{or } x \leq 12$$

$$(14) 14a + 35 < 18a + 9 + 5a$$

$$35 - 9 < 18a + 5a - 14a$$

$$26 < 9a$$

$$\frac{26}{9} < a$$

$$\text{or } a > \frac{26}{9}$$

$$(15) 8x + 14 < 12x + 12 - 2x - 2$$

$$8x + 14 < 10x + 10$$

$$14 - 10 < 10x - 8x$$

$$4 < 2x$$

$$2 < x \text{ or } x > 2$$

$$(16) 15y + 5 \geq 7 - 20y + 6$$

$$15y + 5 \geq -20y + 23$$

$$15y + 20y \geq 23 - 5$$

$$35y \geq 18$$

$$y \geq \frac{18}{35}$$