

19. 131 Express in inequalities.

$$\#6). (-\infty, 4] = x \leq 4,$$

Express in interval notation,

$$8). -1 < x \leq 5 = (-1, 5]$$

$$9). |3 - |-9|| = |3 - 9| = |-6| = \boxed{6}.$$

$$11). 2^{-3} - 3^{-2} = \frac{1}{2^3} - \frac{1}{3^2} = \frac{1}{8} - \frac{1}{9} = \frac{9}{72} - \frac{8}{72} = \frac{1}{72}$$

$$15). \frac{\sqrt{242}}{\sqrt{2}} = \sqrt{121} = 11$$

$$\sqrt{x^2} = \sqrt{121}$$

$$x = \pm 11$$

$$\sqrt{9} = 3.$$

$$-(\sqrt{9}) = -3.$$

$$x^2 = 9$$

$$x = \pm 3.$$

$$2) (3xy^2)^3 \left(\frac{2}{3}x^{-1}y\right)^2$$
$$= \left(\frac{3^3}{1}x^3y^6\right) \left(\frac{4}{1}x^{-2}y^2\right) = \boxed{12xy^8}$$

for.

$$3) 12x^2y^4 - 3xy^5 + 9x^3y^2$$
$$= 3xy^2(4xy^2 - y^3 + 3x^2)$$

$$37) 4t^2 - 13t - 12$$

$$(4t + 3)(t - 4)$$

$$\begin{array}{r} -48 \\ \times \\ -13 \\ \hline \end{array}$$

$$45) (4x^3 - 8x^2) + (3x - 6)$$

$$4x^2(x - 2) + 3(x - 2)$$

$$(4x^2 + 3)(x - 2)$$

$$69) \quad x^2 - 9x + 14 = 0$$
$$(x-7)(x-2) = 0$$

$$x = 7, 2$$

$$71) \quad 2x^2 + x - 1 = 0$$

$$2x^2 + x - 1 = 0$$

$$(2x-1)(x+1) = 0$$

$$x = -1, \frac{1}{2}$$

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P7.131 Express as an inequality

$$5) [-2, 6) \quad -2 \leq x < 6$$

Express as an interval

$$7) x \geq 5 \quad [5, \infty)$$

$$9) |3 - |-9|| \quad \text{“x”}$$
$$= |3 - 9| = |-6| = 6$$

$$15) \frac{\sqrt{242}}{\sqrt{2}} = \sqrt{\frac{242}{2}}$$

$$= \sqrt{121} = 11$$

$$13) 216^{-1/3}$$
$$= \frac{1}{216^{1/3}} = \frac{1}{\sqrt[3]{216}}$$
$$= \sqrt[3]{\frac{1}{6}}$$

or

$$21) (3xy^2)^3 \left(\frac{2}{3}x^{-1}y\right)^2 = \left(\frac{3}{1}x^3y^6\right) \left(\frac{4}{9}x^{-2}y^2\right)$$
$$= \boxed{12xy^8}$$

33) Factor

$$12x^2y^4 - 3xy^5 + 9x^3y^2$$
$$= \boxed{3xy^2(4xy^2 - y^3 + 3x^2)}$$

$$37) 4t^2 - 13t - 12$$

$$(4t - 16)(4t + 3)$$

$$(t - 4)(4t + 3)$$

$$3 (4t^2 - 16t) + (3t - 12)$$

$$4t(t - 4) + 3(t - 4)$$

$$= (4t + 3)(t - 4)$$

$$\begin{array}{r} -48 \\ -16 \quad +3 \\ -13 \end{array}$$

$$4t^2$$

$$2t, 2t$$

$$4t, t$$

$$-12$$

$$12, 1$$

$$6, 2$$

$$3, 4$$

$$45) (4x^3 - 8x^2) + (3x - 6)$$

$$4x^2(x - 2) + 3(x - 2)$$

$$= (4x^2 + 3)(x - 2)$$



$$69) x^2 - 9x + 14 = 0$$

$$(x - 7)(x - 2) = 0$$

$$\begin{array}{r} -7 \quad 14 \\ \times -2 \\ \hline -14 \\ -14 \\ \hline 28 \end{array}$$

$$x = 7, 2$$

71)

$$2x^2 + x = 1$$

$$2x^2 + x - 1 = 0$$

$$(2x - 1)(x + 1) = 0$$

$$x = -1, \frac{1}{2}$$

$$78) x^4 - 8x^2 - 9 = 0$$

$$(x^2 - 9)(x^2 + 1) = 0$$

$$x^2 - 9 = 0$$

$$x = \pm 3$$

$$x^2 + 1 = 0$$

$$x^2 = -1$$

~~$$x = \pm i$$~~

~~$$\begin{array}{r} -9 \\ -9 \quad +1 \\ \hline -8 \end{array}$$~~

$$(x)(x)$$

$$ax^2 + bx + c$$

$$ax^4 + bx^2 + c$$

$$ax^{14} + bx^7 + c$$

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# 52-5

Express as inequality.

5)  $[-2, 6)$

$$-2 \leq x < 6$$

Express as an interval.

7)  $x \geq 5$

$$[5, \infty)$$

9)  $|3 - |-9||$   
 $= |3 - 9| = |-6| = 6$

13)  $216^{-1/3} = \frac{1}{216^{1/3}}$   
 $= \frac{1}{\sqrt[3]{216}} = 1$

15)  $\frac{\sqrt{242}}{\sqrt{2}} = \sqrt{\frac{242}{2}} = \sqrt{121} = 11$

$$21) (3xy^2)^3 \left(\frac{2}{3}x^{-1}y\right)^2,$$
$$= \left(\frac{27}{1}x^3y^6\right) \left(\frac{4}{9}x^{-2}y^2\right) = \boxed{12xy^8}$$

$$33) 12x^2y^4 - 3xy^5 + 9x^3y^2$$

$$3xy^2(4xy^2 - y^3 + 3x^2)$$

$$\frac{x^1}{x^2}$$

$$37) \quad 4t^2 - 13t - 12 = t^2 - \frac{13}{4}t - 3,$$

$$(t - 4) \left( t + \frac{3}{4} \right)$$

$$\boxed{(t - 4)(4t + 3)}$$

~~$$\begin{array}{r} -48 \\ \frac{-16}{4} \quad + \frac{3}{4} \\ \hline -13 \end{array}$$~~

$$4t + 3 = 4 \left( t + \frac{3}{4} \right)$$

$$1, 4$$

$$12, 1$$

$$2, 2$$

$$2, 6$$

$$3, 4$$

$$(4t^2 - 16t) + (3t - 12) - 16$$

$$4t(t - 4) + 3(t - 4)$$

~~$$\begin{array}{r} -48 \\ \quad \quad 3 \\ \hline 13 \end{array}$$~~

$$69) x^2 - 9x + 14 = 0$$

$$(x - 7)(x - 2) = 0$$

$$x = 7, 2$$

$$67) \frac{x+1}{x-1} = \frac{3x}{3x-6}$$

$$= \frac{3x}{3(x-2)}$$

$$\frac{6 \pm \frac{2\sqrt{6}}{6}}{6} = x$$

$$1 \pm \frac{\sqrt{6}}{3}$$

$$3x - 1 = 3x^2 - 3x$$

$$3x^2 - 6x + 1 = 0$$

$$\sqrt{3x^2 - 6x + 1} = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{6 \pm 2\sqrt{6}}{6}$$

$$\frac{6 \pm \sqrt{24}}{6}$$

$$\frac{2a \pm \sqrt{36 - 4(3)(1)}}{6}$$

$$= \frac{6 \pm \sqrt{36 - 12}}{6}$$

$$76) \frac{1(x-1)}{x(x-1)} + \frac{2(x)}{x-1(x)} = 3$$

$$\frac{x-1+2x}{x(x-1)} = 3$$

$$= \frac{3x-1}{x(x-1)} = \frac{3x(x-1)}{1x(x-1)}$$

$$3x-1 = 3x(x-1)$$

$$3x-1 = 3x^2 - 3x$$

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Mixture.