Equation Development 4.1 (KEY)

Solve, check, and graph.

1) $4x^3 + 13 = -19$

$-13 \quad -13$

$\frac{4x^3}{4} = \frac{-32}{4}$

$x^3 = -8$

$\sqrt[3]{x^3} = \sqrt[3]{-8}$

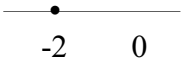
$x = -2$

✓ $4(-2)^3 + 13 = -19$

$4(-8) + 13 = -19$

$-32 + 13 = -19$

$-19 = -19$✓



2) $-4(6x + 5) = -20x + 16$

$-24x - 20 = -20x + 16$

$+ 24x \quad + 24x$

$-20 = 4x + 16$

$- 16 \quad -16$

$\frac{-36}{4} = \frac{4x}{4}$

$-9 = x$

✓ $-4(6(-9) + 5) = -20(-9) + 16$

$-4(-54 + 5) = 180 + 16$

$-4(-49) = 196$

$196 = 196$✓

3) $-25 - 6x = -79 + 3x$

$+ 6x \quad + 6x$

$-25 = -79 + 9x$

$+ 79 \quad + 79$

$\frac{54}{9} = \frac{9x}{9}$

$6 = x$

✓ $-25 - 6(6) = -79 + 3(6)$

$-25 - 36 = -79 + 18$

$-61 = -61$✓

4) $1 > -3p + 10$

$-10 \quad -10$

$-9 > -3p$

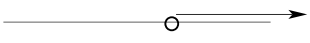
$-3 \quad -3$

$\mathbf{3 < p}$

✓ $1 > -3(5) + 10$

$1 > -15 + 10$

$1 > -5$✓



5) $-14 > -7 - \frac{q}{4}$

$+ 7 \quad + 7$

$(-4)-7 > -\frac{q}{4}\ (-4)$

$\mathbf{28 < q}$

✓ $-14 > -7 - \frac{(32)}{4}$

$-14 > -7 - 8$

$-14 > -15$✓

6) $8m + 15 \leq 2m + 3$

$-2m \quad -2m$

$6m + 15 \leq 3$

$- 15 \quad - 15$

$\frac{6m}{6} \leq \frac{-12}{6}$

$\mathbf{m \leq -2}$

✓ $8(-3) + 15 \leq 2(-3) + 3$

$-24 + 15 \leq -6 + 3$

$-9 \leq -3$✓

7) $\frac{3}{2}X - 5 = 16$

$+5 \quad +5$

$\left(\frac{2}{3}\right)\frac{3}{2}x = 21\left(\frac{2}{3}\right)$

$x = 14$

✓ $\frac{3}{2}(14) - 5 = 16$

$21 - 5 = 16$

$16 = 16$✓

0 14

8) $\frac{3}{4}x - \frac{8}{12}x + 6 = 11$

$\frac{9}{12}X - \frac{8}{12}X + 6 = 11$

$\frac{1}{12}x + 6 = 11$

$-6 \quad -6$

$\left(\frac{12}{1}\right)\frac{1}{12}x = 5\left(\frac{12}{1}\right)$

$x = 60$

✓ $\frac{3}{4}(60) - \frac{8}{12}(60) + 6 = 11$

$\frac{180}{4} - \frac{480}{12} + 6 = 11$

$\frac{540}{12} - \frac{480}{12} + \frac{72}{12} = 11$

$\frac{132}{12} = 11$

$11 = 11$✓

0 60

9) $3|2x + 6| - 7 = 23$

$+7 \quad +7$

$3|2x + 6| = 30$

$3 \quad 3$

$|2x + 6| = 10$

$2x + 6 = 10$ $\quad$ $2x + 6 = -10$

$-6 \quad -6$ $\quad$ $-6 \quad -6$

$2x = 4$ $\quad$ $2x = -16$

$2 \quad 2$ $\quad$ $2 \quad 2$

$x = 2$ $\quad$ $x = -8$

✓ $3|2(2) + 6| - 7 = 23$ $\quad$ $3|2(-8) + 6| - 7 = 23$

$3|4 + 6| - 7 = 23$ $\quad$ $3|-16 + 6| - 7 = 23$

$3|10| - 7 = 23$ $\quad$ $3|-10| - 7 = 23$

$3(10) - 7 = 23$ $\quad$ $3(10) - 7 = 23$

$30 - 7 = 23$ $\quad$ $30 - 7 = 23$

$23 = 23$✓ $\quad$ $23 = 23$✓

-8 0 2

10) $t\sqrt{4} = 5$

$\sqrt{4} \quad \sqrt{4}$

$t = \frac{5}{2}$

✓ $\left(\frac{5}{2}\right)\left(\sqrt{4}\right) = 5$

$(5/2)(2) = 5$

$5 = 5$✓

11) $m + \sqrt{5} = 7$

$-\sqrt{5} \quad -\sqrt{5}$

$m = 7 - \sqrt{5}$

✓ $\left(7 - \sqrt{5}\right) + \sqrt{5} = 7$

$7 = 7$✓

12) $\frac{p}{\sqrt{3}} + 8 = 11$

$-8 \quad -8$

$\left(\sqrt{3}\right)\frac{p}{\sqrt{3}} = 3\sqrt{3}$

$p = 3\sqrt{3}$

✓ $\frac{\left(3\sqrt{3}\right)}{\sqrt{3}} + 8 = 11$

$3 + 8 = 11$

$11 = 11$✓

13) $\sqrt{x} + 5 = 7$

$-5 \quad -5$

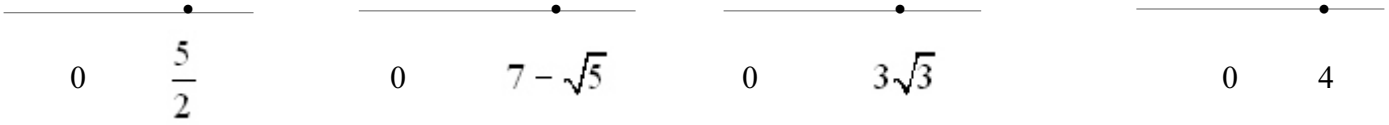
$\sqrt{x}^2 = 2^2$

$x = 4$

✓ $\sqrt{(4)} + 5 = 7$

$2 + 5 = 7$

$7 = 7$✓



14) $4\sqrt{k+1}=32$

$\frac{4}{4}\quad\frac{4}{4}$

$\left(\sqrt{k+1}\right)^2=8^2$

$k+1=64$

$-1\quad -1$

$k=63$

✓ $4\sqrt{((63)+1}=32$

$4\sqrt{64}=32$

$4(8)=32$

$32=32$✓

15) $12\sqrt{b+3}-16=32$

$+16\quad +16$

$12\sqrt{b+3}=48$

$\frac{12}{12}\quad\frac{12}{12}$

$\left(\sqrt{b+3}\right)^2=4^2$

$b+3=16$

$-3\quad -3$

$b=13$

✓ $12\sqrt{(13)+3}-16=32$

$12\sqrt{16}-16=32$

$12(4)-16=32$

$48-16=32$

$32=32$✓

16) $5\sqrt{2d+9}=35$

$\frac{5}{5}\quad\frac{5}{5}$

$\left(\sqrt{2d+9}\right)^2=7^2$

$2d+9=49$

$-9\quad -9$

$\frac{2d}{2}=\frac{40}{2}$

$d=20$

✓ $5\sqrt{2(20)+9}=35$

$5\sqrt{49}=35$

$5(7)=35$

$35=35$✓

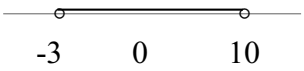
Solve and graph the following inequalities.

17) $-11<2x-5<15$

$+5\quad +5\quad +5$

$\frac{-6<2x<20}{2\quad 2\quad 2}$

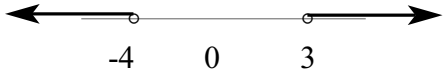
$-3<x<10$



18) $\frac{3x<-12}{3\quad 3}$ or $\frac{2x+3>9}{-3\quad -3}$

$x<-4$ $\qquad \frac{2x>6}{2\quad 2}$

$x<-4$ **$x>3$**



19) $\frac{8>4x>36}{4\quad 4\quad 4}$

$2>x>9$

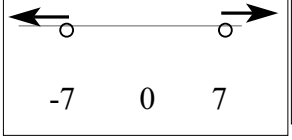
No solution

20) $|x|<3$

$x<3$ and $x>-3$

21) $|x|>7$

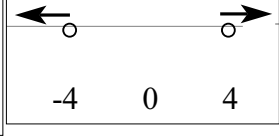
$x>7$ or $x<-7$



22) $|3t|>12$

$\frac{3t>12}{3\quad 3}$ or $\frac{3t<-12}{3\quad 3}$

$t>4$ or $t<-4$

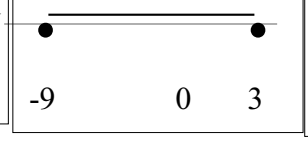


23) $|t+3|\le 6$

$t+3\le 6$ and $t+3\ge -6$

$-3\quad -3\qquad -3\quad -3$

$t\le 3$ and $t\ge -9$



24) $|5w|<45$

$\frac{5w<45}{5\quad 5}$ and $\frac{5w>45}{5\quad 5}$

$w<9$ and $w>9$