Equations and Inequalities
Algebra 2

Solve, check, and graph the following equations and inequalities.

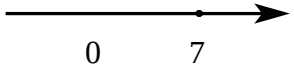
1) $-78 = -9k - 15$

$+15 \quad +15$

$\frac{-63}{-9} = \frac{-9k}{-9}$

$7 = k$

✓ $-78 = -9(7) - 15$
$-78 = -63 - 15$
$-78 = -78$ ✓



2) $63 = \frac{v}{3} + 39$

$-39 \quad -39$

$(3)\ 24 = \frac{v}{3}(3)$

$72 = v$

3) $-81 - 4g^2 = 115$

$+81 \quad +81$

$\frac{-4g^2}{-4} = \frac{196}{-4}$

$g^2 = -49$

$\sqrt{g^2} = \sqrt{-49}$

g = No Real Solution

4) $x + 11x = -108$

$x = -9$

5) $3x + 7 + 3x = -35$

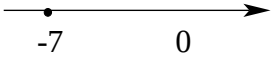
$6x+7=-35$

$-7 \quad -7$

$\frac{6x}{6} = \frac{-42}{6}$

$x = -7$

✓ $3(-7) +7+3(-7)=-35$
$-21+7-21=-35$
$-35 = -35$✓



6) $7x + 19 - 6x = 15$

$x = -4$

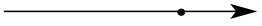
7) $6x = 3x + 21$

$-3x \quad -3x$

$\frac{3x}{3} = \frac{21}{3}$

$x = 7$

✓ $6(7) = 3(7)+21$
$42 = 21+21$
$42 = 42$✓



8) $2d - 24 = 8d$

$d = -4$

9) $11 + 5a = 3a + 41$

$-3a \quad -3a$

$11 + 2a = 41$

$-11 \quad -11$

$\frac{2a}{2} = \frac{30}{2}$

$a = 15$

10) $-2x + 23 = -17 - 10x$

$x = -5$

11) $\frac{2(2x + 6)}{2} = \frac{20}{2}$

$(2x + 6) = 10$

$-6 \quad -6$

$\frac{2x}{2} = \frac{4}{2}$

$x = 2$

12) $102 = 6(3n + 2)$

$n = 5$

13) $3(5v + 8) = 16v + 22$

$15v + 24 = 16v + 22$

$-15v \quad -15v$

$24 = v + 22$

$-22 \quad -22$

$2 = v$

✓ $3(5(2)+8) = 16(2) + 22$

$3(10+8) = 32+22$

$3(18) = 54$

$54= 54$✓

14) $a + 12 > 21$

$a > 9$

15) $b - 15 < 8$

$+ 15 \quad +15$

$b < 23$

✓ $(20)-15<8$

$5<8$ ✓

0 23

16) $-3x + 7 < -17$

$x > 8$

17) $-14x + 5x \geq -54$

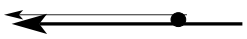
$-9x \geq -54$

$-9 \quad -9$

$x \leq 6$

✓ $-14(0) + 5(0) \geq -54$

$0 \geq -54$



0 6

18) $2x - 24 \geq 8x$

$-4 \geq x$

19) $-2x + 23 \leq -17 - 10x$

$+10x \quad +10x$

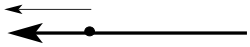
$8x + 23 \leq -17$

$-23 \quad -23$

$8x \leq -40$

$8 \quad 8$

$x \leq -5$



-5 0