# Unit 2 Test Study Guide
(Equations and Inequalities)

Name: Key

Date: _____ Block: _____

## Topic 1: Multi-Step Equations

**1.** $-5(x-2)-(x+2)=50$

$-5x+10-x-2=50$

$-6x+8=50$

$-6x=42$

$x=-7$

**2.** $8-3(k+2)=2-3k$

$8-3k-6=2-3k$

$2-3k=2-3k$

IMS

**3.** $3w-(7w+12)=2(w-3)$

$3w-7w-12=2w-6$

$-4w-12=2w-6$

$-6w-12=-6$

$-6w=6$

$w=-1$

**4.** $-7(a-3)=11-7a$

$-7a+21=11-7a$

$21=11$

No Solutions

**5.** $9(n-4)-7n=32-2(n+8)$

$9n-36-7n=32-2n+(-16)$

$2n-36=16-2n$

$4n-36=16$

$4n=52$

$n=13$

**6.** $4(4y-3)-(y-5)=-52$

$16y-12-y+5=-52$

$15y-7=-52$

$15y=-45$

$y=-3$

## Topic 2: Proportions

**7.** $\frac{2}{9}=\frac{4}{x+8}$

$2x+16=36$

$2x=20$

$x=10$

**8.** $\frac{6}{x-6}=\frac{3}{x-3}$

$6x-18=3x-18$

$3x-18=-18$

$3x=0$

$x=0$

**9.** $\frac{5}{y-7}=\frac{3}{y-5}$

$5y-25=3y-21$

$2y-25=-21$

$2y=4$

$y=2$

**10.** $\frac{6}{2y-5}=\frac{2}{y-7}$

$6y-42=4y-10$

$2y-42=-10$

$2y=32$

$y=16$

## Topic 3: Absolute Value Equations

**11.** $|x + 1| = 6$

$x+1=6$ $\quad x+1=-6$

$x=5$ $\quad x=-7$

$x=\{5,-7\}$

**12.** $|6c - 18| = 30$

$6c-18=30$ $\quad 6c-18=-30$

$+18 \quad +18$

$6c=48$ $\quad 6c=-12$

$c=8$ $\quad c=-2$

$c=\{-2,8\}$

**13.** $-4|2w + 6| = -32$

$|2w+6|=8$

$2w+6=8$ $\quad 2w+6=-8$

$2w=2$ $\quad 2w=-14$

$w=1$ $\quad w=-7$

$w=\{-7,1\}$

**14.** $5|4x - 4| - 9 = 31$

$|4x-4|=8$

$4x-4=8$ $\quad 4x-4=-8$

$4x=12$ $\quad 4x=-4$

$x=3$ $\quad x=-1$

$x=\{-1,3\}$

## Topic 4: Multi-Variable Equations

**15.** Solve $I = prt$ for $t$

$\frac{I}{pr} = \frac{prt}{pr}$

$t=\frac{I}{pr}$

**16.** Solve $Ax + By = C$ for $y$

$-Ax \quad -Ax$

$\frac{By}{B}=\frac{C-Ax}{B}$

$y=\frac{C-Ax}{B}$

## Topic 5: Multi-Step Inequalities

**17.** $2(x + 3) \geq 4(x - 1)$

$2x+6 \geq 4x-4$

$-2x+6 \geq -4$

$-2x \geq -10$

$x \leq 5$


Interval Notation: $(-\infty, 5]$

**18.** $5x + 24 > 2(x - 9) - 3x$

$5x+24>2x-18-3x$

$5x+24>-x-18$

$6x+24>-18$

$6x>-42$

$x>-7$


Interval Notation: $(-7, \infty)$

**19.** $-9(x-5)+9<3x+42$

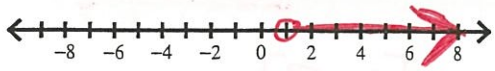
$-9x+45+9<3x+42$

$-9x+54<3x+42$

$-12x+54<42$

$-12x<-12$

$x>1$



Interval Notation: $(1,\infty)$

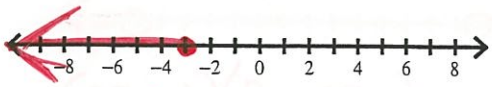
**20.** $2(x+1)\le -13-3x$

$2x+2\le -13-3x$

$5x+2\le -13$

$5x\le -15$

$x\le -3$



Interval Notation: $(-\infty,-3]$

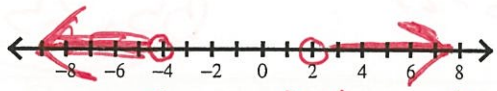
## Topic 6: Compound Inequalities

**21.** $-4x-11>5$ or $8x-7>9$

$+11\ +11$ $\quad +7\ +7$

$-4x>16$ $\quad 8x>16$

$x<-4$ $\quad x>2$



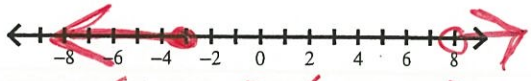
Interval Notation: $(-\infty,-4)\ (2,\infty)$

**22.** $-2x-1<-17$ or $1-x\ge 4$

$+1\ +1$ $\quad -1\ -1$

$-2x<-16$ $\quad -x\ge 3$

$x>8$ $\quad x\le -3$



Interval Notation: $(-\infty,-3]\ (8,\infty)$

**23.** $-31<9x+5<32$

$-5\ \ -5\ \ -5$

$\frac{-36}{9}<\frac{9x}{9}<\frac{27}{9}$

$-4<x<3$

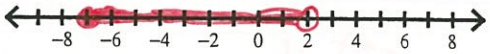
Interval Notation:

**24.** $-24\le 2x-10<-6$

$+10\ \ +10\ \ +10$

$-14\le 2x<4$

$-7\le x<2$



Interval Notation:

## Topic 7: Absolute Value Inequalities

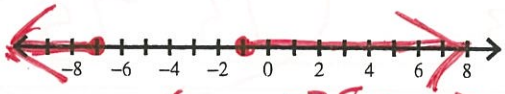
**25.** $|2x+8|\ge 6$

$2x+8\ge 6$ $\quad 2x+8\le -6$

$-8\ -8$ $\quad -8\ -8$

$2x\ge -2$ $\quad 2x\le -14$

$x\ge -1$ $\quad x\le -7$



Interval Notation: $(-\infty,-7]\ [-1,\infty)$

**26.** $|7x+7|<35$

$7x+7<35$ $\quad 7x+7>-35$

$-7\ \ -7$ $\quad -7\ \ -7$

$7x<28$ $\quad 7x>-42$

$x<4$ $\quad x>-6$

Interval Notation: $(-6,4)$

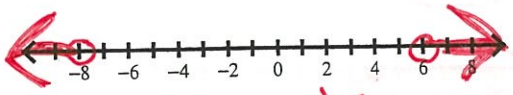
**27.** $|5x + 5| + 22 > 57$

$|5x+5| > 35$

$5x+5 > 35$ $\quad$ $5x+5 < -35$

$5x > 30$ $\quad$ $5x < -40$

$x > 6$ $\quad$ $x < -8$




Interval Notation: $(-\infty, -8)(6, \infty)$

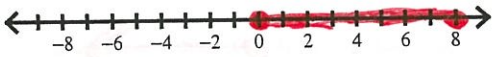
**28.** $2|x - 4| - 7 \leq 1$

$|x-4| \leq 4$

$x-4 \leq 4$ $\quad$ $x-4 \geq -4$

$+4 \quad +4$ $\quad$ $x \geq 0$

$x \leq 8$




Interval Notation: $[0, 8]$

## Topic 8: Word Problems

**29.** A larger number is five more than twice a smaller number. Their sum is 80. Find the numbers.

$s$ = smaller #

$2s+5$ = larger #

$s + 2s + 5 = 80$

$3s + 5 = 80$

$3s = 75$

$s = 25$

55, 25

**30.** A rectangle has a length six inches less than twice its width. If the perimeter of the rectangle is 54 inches, find the dimensions. $w$ = width $\quad$ $l = 2w - 6$

$54 = 2(2w-6) + 2w$

$54 = 4w - 12 + 2w$

$54 = 6w - 12$

$66 = 6w$

$w = 11$

$w = 11 \quad l = 16$

**31.** The sum of two consecutive numbers is 45. Find the numbers.

$x$ = 1st #

$x+1$ = 2nd #

$x + x + 1 = 45$

$2x + 1 = 45$

$2x = 44$

$x = 22$

22, 23

**32.** The sum of two consecutive odd numbers is 148. Find the numbers.

$x$ = 1st #

$x+2$ = 2nd #

$x + x + 2 = 148$

$2x + 2 = 148$

$2x = 146$

$x = 73$

73, 75