Algebra 2 Equation Development 2.1 (Key)

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

1) $4d^3 + 47 = -61$

$-47 \quad -47$

$\frac{4d^3}{4} = \frac{-108}{4}$

$d^3 = -27$

$\sqrt[3]{d^3} = \sqrt[3]{-27}$

d = -3

✓$4(-3)^3 + 47 = -61$

$4(-27) + 47 = -61$

$-108 + 47 = -61$

$-61 = -61$✓

2) $-13x + 17x = -16$

x = -4

3) $163 + 6k = 53 + 17k$

$-6k \quad -6k$

$163 = 53 + 11k$

$-53 \quad -53$

$\frac{110}{11} = \frac{11k}{11}$

10 = k

✓$163 + 6(10) = 53 + 17(10)$

$163 + 60 = 53 + 170$

$223 = 223$✓

4) $-201 = 3(7x - 4)$

x = -9

5) $4t + 5 \geq 21$

t ≥ 4

6) $-3m - 7 < 14$

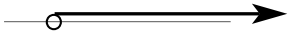
$+7 \quad +7$

$\frac{-3m}{-3} < \frac{21}{-3}$

m > -7

✓$-3(0) - 7 < 14$

$-7 < 14$✓



7) $12x - 7x - 16 < -56$

x < -8

8) $3(-2x + 11) \leq 129$

$-6x + 33 \leq 129$

$-33 \quad -33$

$\frac{-6x}{-6} \leq \frac{96}{-6}$

x ≥ -16

✓ $3(-2(0) + 11) \leq 129$

$3(11) \leq 129$

$33 \leq 129$ ✓

9) $x + \frac{2}{3} = \frac{5}{3}$

$-2/3 \quad -2/3$

$x = 3/3 = 1$

✓$(3/3) + 2/3 = 5/3$

$5/3 = 5/3$✓

10) $x - \frac{1}{4} = \frac{3}{4}$

x = 1

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

$-3/2 \quad -3/2$

$x = 2/6 - 9/6$

x = -7/6

✓ $(-7/6) + 3/2 = 1/3$

$-7/6 + 9/6 = 1/3$

$2/6 = 1/3$

$1/3 = 1/3$✓

12) $x - \frac{3}{4} = \frac{1}{8}$

x = 7/8

13) $\frac{1}{4}X = \frac{1}{16}$

$(\frac{4}{1})\frac{1}{4}x = \frac{1}{16}(\frac{4}{1})$

x = **1/4**

14) $\frac{2}{9}X = \frac{9}{2}$

$(\frac{9}{2})\frac{2}{9}x = \frac{9}{2}(\frac{9}{2})$

x = **81/4**

✓(2/9)(81/4) = 9/2

9/2 = 9/2✓

0 **81/4**

15) $\frac{3}{7}X = \frac{4}{9}$

x = **28/27**

16) $\frac{3}{8}X = \frac{5}{12}$

$(\frac{8}{3})\frac{3}{8}x = \frac{5}{12}(\frac{8}{3})$

x = **10/9**

✓(3/8)(10/9) = 5/12

5/12 = 5/12✓

0 **10/9**

Evaluate each expression if x = 3, y = -6, and z = -1.5

17) $|-5x|$

$|-5(3)| = |-15|$

$= 15$

18) $|-9y|$

19) $|6z|$

54 9 72

20) $|4xy|$

21) $-|-2yz|$

$-|-2(-6)(-1.5)|$

$= -|-18| = -(18)$

$= -18$

Solve, check, and graph the following equations.

22) $|w| = 5$

w = 5, -5

23) $|x + 4| = 13$

x + 4 = 13 x + 4 = -13

- 4 - 4 - 4 -4

x = 9 x = -17

✓ |(9) + 4| = 13 |(-17) + 4| = 13

|13| = 13 |-13| = 13

13 = 13 13 = 13✓

-17 0 9

24) $|b - 7| = -4$

∅, No solution

25) $3|t - 5| = 9$

$\frac{3|t - 5|}{3} = \frac{9}{3}$

$|t - 5| = 3$

t - 5 = 3 t - 5 = -3

+ 5 + 5 + 5 + 5

t = 8 t = 2

✓$3|(8) - 5| = 9$ $3|(2) - 5| = 9$

$3|3| = 9$ $3|-3| = 9$

$3(3) = 9$ $3(3) = 9$

$9 = 9$ $9 = 9$✓

0 2 8

Solve the following literal equations in terms of the underlined variable.

26) a + 5 = b

-5 -5

a = b - 5

27) c + d = 12

c = -d + 12

28) 5f + g = 8

- g - g

5f = -g + 8

5 5

$f = \frac{-g + 8}{5}$

29) $\frac{j}{2} + k = 7$

-k -k

$(2)\frac{j}{2} = (-k + 7)2$

j = -2k + 14

30) $\frac{4}{5}p = 3q$

31) $tv = 9$

32) $\frac{3}{8}xyz = w$

33) $3a + 2b = 5$

$p = \frac{15q}{4}$

$t = \frac{9}{v}$

$x = \frac{8w}{3yz}$

$a = \frac{-2b + 5}{3}$

$a = \frac{-2b}{3} + \frac{5}{3}$