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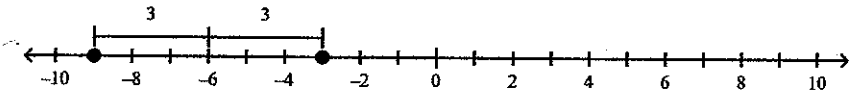
9:00

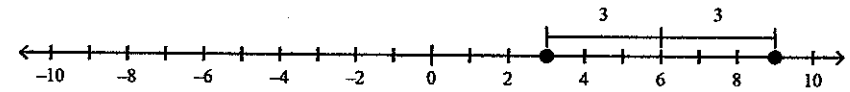
Algebra 1 Study Guide 1.4 - 1.5

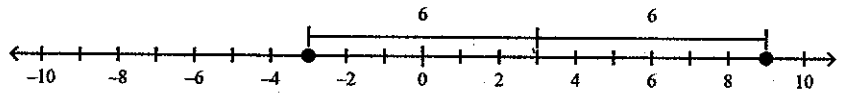
9:26

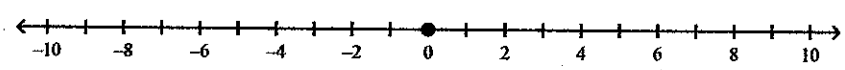
Matching

Match the absolute value equation below with its graph without solving the equation.

a. 

b. 

c. 

d. 

e. no solution

f. 

c 1. $|x-3|=6$ mp=3 d=6

d 2. $|x|-3=-3$ $|x|=0$

f 3. $|x+3|=6$ mp, -3 d=6

a 4. $|x+6|=3$ mp -6 d=3

e 5. $|x|+3=-3$ $|x|=-6$

b 6. $|x-6|=3$

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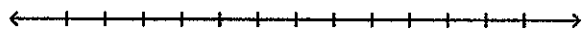
Short Answer

Solve the equation. Graph the solution(s), if possible.

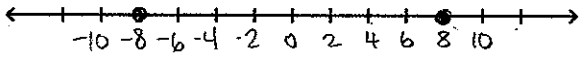
7. $|x| = -4$ no solution



8. $\left|\frac{z}{8}\right| = 1$

$\frac{z}{8} = 1$ or $\frac{z}{8} = -1$

$z = 8$ or $z = -8$



Solve the equation.

9. $|y - 5| + 6 = 9$

$-6 \quad -6$

$|y - 5| = 3$

$y - 5 = 3$ or $y - 5 = -3$

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

$y = 8$ or $y = 2$

10. **Solve the equation.**

$-8|3y-1|-4=-20$

$+4 \quad +4$

$\frac{-8|3y-1|}{-8} = \frac{-16}{-8}$

$|3y-1| = 2$

$3y-1=2$ or $3y-1=-2$

$+1 \quad +1 \qquad +1 \quad +1$

$3y=3$ or $3y=-1$

$y=1$ or $y=\frac{-1}{3}$

Solve the equation.

11. $|2k+6|=|k|$

$2k+6=k$ or $2k+6=-k$

$-k \quad -k \qquad -2k \quad -2k$

$k+6=0$ or $6=-3k$

$k=-6$ or $\frac{6}{-3}=k$

$-2=k$

Solve the equation. Check your solutions.

12. $|6k+3|=|7k+2|$

$6k+3=7k+2$ or $6k+3=-(7k+2)$

$-6k \quad -6k$

$3=k+2$

$-2 \quad -2$

$1=k$

$6k+3=-7k-2$

$+7k \quad +7k$

$13k+3=-2$

$-3 \quad -3$

$13k=-5$

$k=\frac{-5}{13}$

Check:

$|6(1)+3| \stackrel{?}{=} |7(1)+2|$

$|6+3| = |7+2|$

$|9| = |9|$

$9=9$ ✓

$|6(\frac{-5}{13})+3| = |7(\frac{-5}{13})+2|$

$|\frac{-30}{13}+\frac{39}{13}| = |\frac{-35}{13}+\frac{26}{13}|$

$|\frac{9}{13}| = |\frac{-9}{13}|$

$\frac{9}{13} = \frac{9}{13}$ ✓

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13. **Solve the equation. Check your solutions.**
$|-7a-10| = -10a$

$-7a-10 = -10a$ or $-7a-10 = 10a$
$+7a \quad +7a$ $+7a \quad +7a$
$-10 = -3a$ $-10 = 17a$
$\frac{10}{3} = a$ $\frac{-10}{17} = a$

Check

$|-7(\frac{10}{3})-10| = -10(\frac{10}{3})$
$|\frac{-70}{3} - \frac{30}{3}| = \frac{-100}{3}$
$|\frac{-100}{3}| = \frac{-100}{3}$
$\frac{100}{3} = \frac{-100}{3}$
False

$|-7(\frac{-10}{17})-10| = -10(\frac{-10}{17})$
$|\frac{70}{17} - \frac{170}{17}| = \frac{100}{17}$
$|\frac{-100}{17}| = \frac{100}{17}$
$\frac{100}{17} = \frac{100}{17}$ ✓

14. **For an essay contest, the minimum length of an essay is 188 words. The maximum length is 376 words. Write an absolute value equation that represents the minimum and maximum lengths.**

min = 188
max = 376
$\frac{376+188}{2} = \frac{564}{2} = 282$ midpoint

376 − 282 = 94 distance

$|x - 282| = 94$

Solve the literal equation for *y*.

15. $2x+5y=3y+8$
$-3y \quad -3y$
$2x+2y=8$
$-2x \quad -2x$
$\frac{2y}{2} = \frac{8}{2} - \frac{2x}{2}$
$y = 4 - x$

Solve the literal equation for x.

16. $-8x - 14x = u$

$x(-8-14) = u$

$x(-22) = u$

$x = \frac{-u}{22}$

17. The volume V of a cone is given by the formula $V = \frac{1}{3}\pi r^2 h$, where r is the radius of the base and h is the height.

a. Solve the formula for the height h. $V = \frac{1}{3}\pi r^2 h$

$\frac{3V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$

$\frac{3V}{\pi r^2} = h$

b. A cone has a volume of 120π cubic centimeters and a radius of 6 inches. What is the height of the cone?

$V = 120\pi$

$r = 6$

$\frac{3(120\pi)}{\pi(6)^2} = h$

$\frac{360\pi}{36\pi} = h$

$10 = h$

The height of the cone is 10 cm.

Other

18. In a tile factory, a bathroom tile is supposed to have an area of 696 square centimeters. An acceptable tile can be within 1.69 square centimeters of the target area. Two tiles are carefully measured. The first tile has a length of 23.4 centimeters and a width of 29.8 centimeters. The second tile has a length of 23.2 centimeters and a width of 28.1 centimeters.

a. Write and solve an absolute value equation to find the minimum and maximum acceptable area for a bathroom tile.

Ideal = 696 cm^2

Error = 1.69 cm^2

$|x - 696| = 1.69$

$x - 696 = 1.69$

$x = 697.69$

$x - 696 = -1.69$

$x = 694.31$

b. Determine whether the two tiles are acceptable. Explain.

A_1: 23.4 · 29.8 = 697.32

A_2: 23.2 · 28.1 = 651.92

The first tile is acceptable but the second is not.

19. Another temperature formula is $F = \frac{9(K-273.15)}{5} + 32$, where F is degrees Fahrenheit and K is degrees Kelvin.

a. Solve the temperature formula for K.

$F = \frac{9(K-273.15)}{5} + 32$

$F - 32 = \frac{9(K-273.15)}{5}$

$\frac{5}{9}(F-32) = K - 273.15$

$\frac{5}{9}(F-32) + 273.15 = K$

b. The melting point of the element calcium is 1548° F. Find its melting point to the nearest degree Kelvin.

$\frac{5}{9}(1548-32) + 273.15 = K$

$\frac{5}{9}(1516) + 273.15 = K$

$1115 = K$

The melting point of calcium is 1115° K.