A-REI.B: Skills Practice Problems

2.3 #13-18

Leon plays on the varsity basketball team. So far this season he has scored a total of 52 points. He scores an average of 13 points per game. The function $f(x) = 13x + 52$ represents the total number of points Leon will score this season. Write and solve an inequality to answer each question.

13. How many more games must Leon play in order to score at least 117 points?

$f(x) = 13x + 52$
$117 \le 13x + 52$
$65 \le 13x$
$5 \le x$
Leon must play in 5 or more games to score at least 117 points.

14. How many more games must Leon play in order to score fewer than 182 points?

15. How many more games must Leon play in order to score more than 143 points?

16. How many more games must Leon play in order to score at least 100 points?

17. How many more games must Leon play in order to score fewer than 85 points?

18. How many more games must Leon play in order to score more than 200 points?

2.5 #13-18

Solve each linear absolute value equation.

13. $|x + 9| = 2$

$(x + 9) = 2$ or $-(x + 9) = 2$
$x + 9 - 9 = 2 - 9$ or $x + 9 = -2$
$x = -7$ or $x + 9 - 9 = -2 - 9$
$x = -11$

14. $|x + 4| = 10$

15. $|x - 12| = 5$

16. $|2x - 6| = 18$

17. $|3x + 1| = -9$

18. $|5x + 1| = 14$

2.4 #33-38

Solve each compound inequality. Then graph and describe the solution.

33. $-3 < x + 7 \le 17$

$-3 < x + 7 \le 17$
$-3 - 7 < x + 7 - 7 \le 17 - 7$
$-10 < x \le 10$

Solution: $-10 < x \le 10$

34. $4 \le 2x + 2 < 12$

35. $x + 5 > 14$ or $3x < 9$

36. $-5x + 1 \ge 16$ or $x - 6 \le -8$

37. $28 \le \frac{7}{8}x < 42$

38. $-2x + 5 \le 9$ or $-x - 13 > -31$

2.5 #19-24

Solve each linear absolute value equation.

19. $|x| - 8 = 25$

$|x| - 8 = 25$

$|x| - 8 + 8 = 25 + 8$

$|x| = 33$

$x = 33$

$-(x) = 33$

$x = -33$

20. $|x + 3| - 7 = 40$

21. $2|x - 6| = 48$

22. $3|x + 8| = 36$

23. $5|x| + 4 = 79$

24. $2|x| - 5 = 11$

3.2 #13-18

The basketball booster club runs the concession stand during a weekend tournament. They sell hamburgers for $2.50 each and hot dogs for $1.50 each. They hope to earn $900 during the tournament. The equation $2.50b + 1.50h = 900$ represents the total amount the booster club hopes to earn. Use this equation to determine each unknown value.

13. If the booster club sells 315 hamburgers during the tournament, how many hot dogs must they sell to reach their goal?

$2.50b + 1.50h = 900$

$2.50(315) + 1.50h = 900$

$787.50 + 1.50h = 900$

$1.50h = 112.50$

$h = 75$

The booster club must sell 75 hot dogs to reach their goal.

14. If the booster club sells 420 hot dogs during the tournament, how many hamburgers must they sell to reach their goal?

15. If the booster club sells 0 hot dogs during the tournament, how many hamburgers must they sell to reach their goal?

16. If the booster club sells 0 hamburgers during the tournament, how many hot dogs must they sell to reach their goal?

17. If the booster club sells 281 hamburgers during the tournament, how many hot dogs must they sell to reach their goal?

18. If the booster club sells 168 hot dogs during the tournament, how many hamburgers must they sell to reach their goal?

2.5 #25-30

Solve each linear absolute value inequality. Graph the solution on the number line.

25. $|x + 5| < 2$

$(x + 5) < 2$

$x + 5 - 5 < 2 - 5$

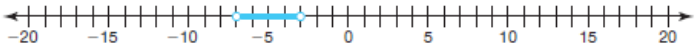
$x < -3$

$-(x + 5) < 2$

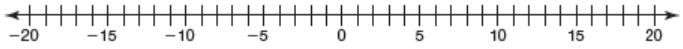
$x + 5 > -2$

$x + 5 - 5 > -2 - 5$

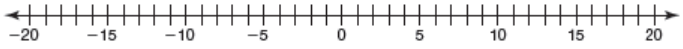
$x > -7$



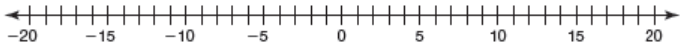
26. $|x - 3| \leq 6$



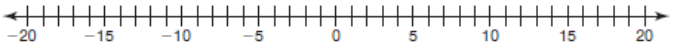
27. $2|x - 1| < 14$



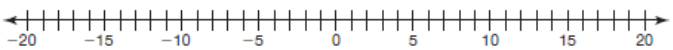
28. $3|x + 4| \geq 9$



29. $2|x - 1| - 8 \leq 10$



30. $3|x + 2| + 5 \geq 23$



3.3 #19-24

Solve each equation for the variable indicated.

19. The formula for the area of a triangle is $A = \frac{1}{2}bh$. Solve the equation for h.

$A = \frac{1}{2}bh$

$(2)A = 2\left(\frac{1}{2}bh\right)$

$2A = bh$

$\frac{2A}{b} = \frac{bh}{b}$

$\frac{2A}{b} = h$

20. The formula for the area of a trapezoid is $A = \frac{1}{2}(b_1 + b_2)h$. Solve the equation for b_1.

21. The formula for the area of a circle is $A = \pi r^2$. Solve the equation for r.

22. The formula for the volume of a cylinder is $V = \pi r^2 h$. Solve the equation for h.

23. The formula for the volume of a pyramid is $V = \frac{1}{3}lwh$. Solve the equation for w

24. The formula for the volume of a sphere is $V = \frac{4}{3}\pi r^3$. Solve the equation for r.

3.4 #1-6

Write a linear function in two different ways to represent each problem situation.

1. Mei paints and sells ceramic vases for $35 each. Each month she typically breaks 3 vases in the kiln. Write a linear function that represents the total amount Mei earns each month selling vases taking into account the value of the vases she breaks.

   $f(x) = 35(x - 3)$

   $f(x) = 35x - 105$

2. Isabel makes and sells fruit pies at her bakery for $12.99 each. Each month she gives away 4 pies as samples. Write a linear function that represents the total amount Isabel earns each month selling fruit pies taking into account the value of the pies she gives away as samples.

3. Mattie sells heads of lettuce for $1.99 each from a roadside farmer's market stand. Each week she loses 2 heads of lettuce due to spoilage. Write a linear function that represents the total amount Mattie earns each week selling heads of lettuce taking into account the value of the lettuce she loses due to spoilage.

4. Carlos prints and sells T-shirts for $14.99 each. Each month 5 T-shirts are misprinted and cannot be sold. Write a linear equation that represents the total amount Carlos earns each month selling T-shirts taking into account the value of the T-shirts that cannot be sold.

5. Odell prints and sells posters for $20 each. Each month 1 poster is misprinted and cannot be sold. Write a linear equation that represents the total amount Odell earns each month taking into account the value of the poster that cannot be sold.

6. Emilio builds and sells homemade wooden toys for $40 each. Each month he donates 3 toys to a children's hospital. Write a linear equation that represents the total amount Emilio earns each month selling toys taking into account the toys he donates.

5.6 #19-26

Solve each exponential equation for x.

19. $4^x = 256$

$4^x = 256$

$4^4 = 256$

$x = 4$

20. $6^{3x} = 216$

21. $2^{5-x} = \frac{1}{16}$

22. $3^{-2x} = \frac{1}{729}$

23. $4^{x+3} = 4$

24. $\frac{1}{5^{x+4}} = 625$

25. $-6^{x-2} = \frac{1}{-1296}$

26. $\frac{1}{2^{x-6}} = \frac{1}{4}$