Name: ANSWER KEY

For 1-10, solve the equation for the variable.

1. $16x^4 - 58 = 23$ $\pm \dfrac{3}{2}$

   $\underline{+58 \quad +58}$

   $\cancel{16}x^4 = 81$

   $\dfrac{}{16} \qquad \dfrac{}{16}$

   $\sqrt[4]{x^4} = \sqrt[4]{\dfrac{81}{16}}$

   $x = \pm\dfrac{3}{2}$

2. $4x\left(\dfrac{x-1}{x} - \dfrac{5}{4} = \dfrac{5}{x}\right)$ -24

   $4(x-1) - 5 \cdot x = 5 \cdot 4$

   $4x - 4 - 5x = 20$

   $-4 - x = 20$

   $\underline{+4 \qquad +4}$

   $-x = 24$

   $x = -24$

3. $5x\left(-\dfrac{9}{x} - \dfrac{7}{5} = -\dfrac{1}{x}\right)$ $-\dfrac{40}{7}$

   $-9 \cdot 5 - 7x = -1 \cdot 5$

   $-45 - 7x = -5$

   $-7x = 40$

   $x = -\dfrac{40}{7}$

4. $\dfrac{x-1}{3} = \dfrac{9}{27}$ 2

   $27(x-1) = 27$

   $27x - 27 = 27$

   $\underline{+27 \quad +27}$

   $27x = 54$

   $x = 2$

5. $\dfrac{4x}{7x+9} = 1$ -3

   $4x = 7x + 9$

   $\underline{-7x \quad -7x}$

   $-3x = 9$

   $x = -3$

6. $\dfrac{3}{x} = 7$ $\dfrac{3}{7}$

   $\dfrac{3}{7} = \dfrac{7x}{7}$

   $\dfrac{3}{7} = x$

7. $\sqrt{m^2} = 7^2$ 49

   $m = 49$

8. $\sqrt{t-5}^2 = 4^2$ 21

   $t - 5 = 16$

   $\underline{+5 \qquad +5}$

   $t = 21$

9. $\sqrt{2t+6}^2 = \sqrt{10t+2}^2$ $\dfrac{1}{2}$

   $2t + 6 = 10t + 2$

   $\underline{-2t - 2 \qquad -2t - 2}$

   $\dfrac{4}{8} = \dfrac{8t}{8}$

   $\dfrac{1}{2} = t$

   $2t + 6 = 10t + 2$

   $-10t - 6 \quad -10t - 6$

   $\dfrac{-8t}{-8} = \dfrac{-4}{-8}$

   $t = \dfrac{1}{2}$

10. $\sqrt{n^2} = 9^2$ 81

    $n = 81$

For 11- 26, simplify each expression.

11. 4^3 64

12. 9^2 81

13. $\sqrt{16}$ 4

14. $3^4 = $ 81

$2^4 = $ 16

$5^2 = $ 25

15. 2^3 **8**

16. $5\sqrt{10}+3\sqrt{10}$ **$8\sqrt{10}$**

17. $\sqrt{36a}+\sqrt{25a}+\sqrt{4a}$ **$13\sqrt{a}$**
$= 6\sqrt{a} + 5\sqrt{a} + 2\sqrt{a}$
$= 13\sqrt{a}$

18. $\sqrt{96}$ **$4\sqrt{6}$**
$= \sqrt{16\cdot 6}$
$= 4\sqrt{6}$

19. $\sqrt{\frac{121}{64}}$ **$\frac{11}{8}$**

For 20- 24, write an algebraic expression, equation, or inequality for each statement. Be sure to define any variables you use.

20. Linda and Juan went shopping. Linda spent \$12 less than Juan. Write an algebraic expression for how much Linda spent.

J - 12

$J =$ amt. Juan spent
$L =$ " Linda "
$L = J - 12$

21. The sum of the cube of a number and fifteen times the number.

$n^3 + 15n$

22. Half of a number is seven.

$\frac{1}{2}n = 7$ or $\frac{n}{2} = 7$

23. Twice a number is six.

$2n = 6$

24. Seven less than twice a number is 8.

$2n - 7 = 8$

For 25 - 29, solve the equation for the variable.

25. $x+11=20$ **9**
$\underline{-11 \qquad -11}$
$x = 9$

26. $14 = 2a$ **7**
$\frac{14}{2} = \frac{2a}{2}$
$7 = a$

27. $3\cdot\frac{y}{3}=2\cdot 3$ **6**
$y = 6$

28. $-z = 5$ **-5**
$\frac{-z}{-1} = \frac{5}{-1}$
$z = -5$

29. $\frac{3}{6}q = -\frac{2}{2}$ **-2**
$2\cdot\frac{1}{2}q = -1\cdot 2$
$q = -2$

$\frac{3q}{6} = -\frac{2}{2}$
$\frac{6q}{6} = -\frac{12}{6}$
$q = -2$

$\frac{6}{3}\cdot\frac{3}{6}q = -\frac{2}{2}\cdot\frac{6}{3}$
$q = -2$

For 30 - 33, simplify the expression.

30. $9+2(9+1)=$ **29**
$9+18+2=$
29

31. $3+36÷9+5·2^2=$ **27**
$3+ \quad 4 \quad +5·4=$
$3+4+20=$
27

32. $\dfrac{-(8)}{2(-8)} = \dfrac{1}{2}$
$\dfrac{1}{7·1}$

33. $5+(-13)-(-46)-32=$ **6**
$5-13+46-32=$
6

Solve the following problems.

34. A rental car company charges $30 plus 25 cents per each mile driven.

A) Which of the following could be used to model the total cost of the rental where m represents the miles driven?

$\underline{\quad} C = 25m + 30$
$\times\underline{\quad} C = 0.25m + 30$
$\underline{\quad} C = 2.5m + 30$

B) The total cost of driving 100 miles is: **$55**

35. The Booster Club has a goal of raising at least $300. The Club has already raised $100. The Booster Club is sponsoring a pancake breakfast and charging $6.00 per ticket.

Which inequality represents the number of tickets (t) that the Booster Club must sell to meet its goal?

$\times\underline{\quad} 6·t + 100 \geq 300$

$\underline{\quad} 6·t \geq 100$

$\underline{\quad} (6+100)t \geq 300$

$\underline{\quad} 6·t \geq 300$

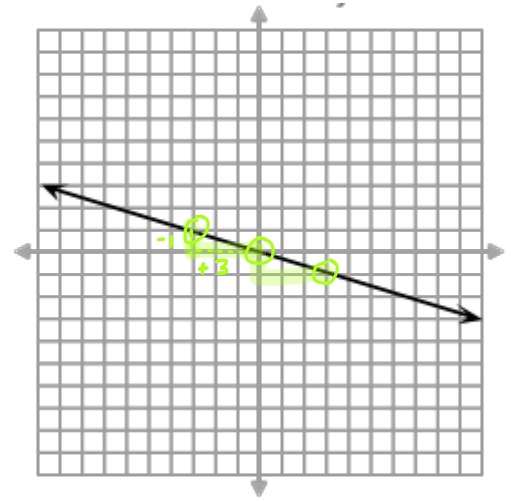**For 36 and 37, find the slope of the line shown on the graph:**

36.

$\dfrac{5}{4}$

+4

+5
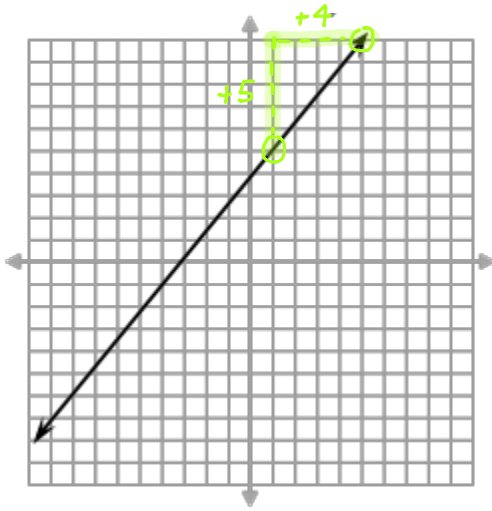
37.

$-\dfrac{1}{3}$

For 38-39, find the slope of the line through the given points.

38. (-3, 5) and (2, -4) $-\dfrac{9}{5}$

$m = \dfrac{-4-5}{2++3} = \dfrac{-9}{5}$

or

$m = \dfrac{5--4}{-3-2} = \dfrac{9}{-5}$

39. (12, 7) and (12, 15) $\dfrac{8}{0}$ no slope
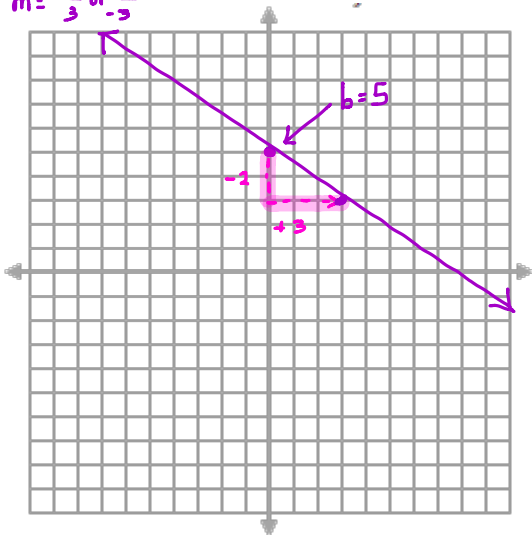
$m = \dfrac{15-7}{12-12} = \dfrac{8}{0}$

or

$m = \dfrac{7-15}{12-12} = \dfrac{-8}{0}$

no slope

For 40-41, graph the line for each equation.

40. y = -⅔ x + 5   m   b

$m = \dfrac{-2}{3} \text{ or } \dfrac{2}{-3}$

b=5

-2

+3

41. y = 3x - 4   m   b

$m = 3 = \dfrac{3}{1} = \dfrac{-3}{-1}$

b