

Math Bowl – Integer equations +, -, ×, ÷

1. If $f(x) = 4 * (x-1)$ and $g(x) = 2x - x$, then what is $g(f(3))$?
(hint: first find $f(3)$, then use the $g(x)$ equation)

$$f(3) = 4(3-1) = 8$$

$$g(x) = 2x - x = 2(8) - 8 = 8 \quad 8$$

Evaluating Variable Expressions

Evaluate each using the values given.

1) $n^2 - m$; use $m = 7$, and $n = 8$

$$8^2 - 7 = 57$$

2) $8(x - y)$; use $x = 5$, and $y = 2$

$$24$$

3) $yx \div 2$; use $x = 7$, and $y = 2$

$$7$$

4) $m - n \div 4$; use $m = 5$, and $n = 8$

$$3$$

5) $x - y + 6$; use $x = 6$, and $y = 1$

$$11$$

6) $z + x^3$; use $x = 1$, and $z = 19$

$$20$$

7) $y + yx$; use $x = 15$, and $y = 8$

$$128$$

8) $q \div 6 + p$; use $p = 10$, and $q = 12$

$$12$$

9) $x + 8 - y$; use $x = 20$, and $y = 17$

$$11$$

10) $15 - (m + p)$; use $m = 3$, and $p = 10$

$$2$$

Solving One-step Equations

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If you are asked to solve an equation for a variable, you need to find a value for the variable that makes the equation true.

One-step equations require you to reverse the operation of the problem to find the value of the variable.

Examples:

Addition Property of Equality: You can add or subtract the same number from both sides of an equation and the equation will stay balanced.

A. $x + 3 = 9$

$$x + 3 - 3 = 9 - 3$$

(subtract 3 from both sides)

$$x = 6$$

B. $x - 5 = 12$

$$x - 5 + 5 = 12 + 5$$

(add 5 to both sides)

$$x = 17$$

Multiplication Property of Equality: You can multiply or divide both sides of an equation by the same number and the equation will stay balanced.

C. $5x = 25$

$$\frac{5x}{5} = \frac{25}{5}$$

(divide both sides by 5)

$$x = 5$$

D. $\frac{x}{4} = 8$

$$\frac{x}{4} \times 4 = 8 \times 4$$

(multiply both sides by 4)

$$x = 32$$

Solve the following problems using the Properties of Equality. Show each step. Write the answer on the line.

1. $x + 9 = 12$ 3

9. $6x = 18$ 3

2. $x + 15 = 28$ 13

10. $8x = 56$ 7

3. $x + 5 = -8$ -13

11. $15x = -45$ -3

4. $x + 25 = -15$ -40

12. $3x = -36$ -12

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One-Step Equations With Integers

Solve each equation.

1) $v - 10 = -9$

$$\frac{+10 \quad +10}{\quad}$$

$$v = 1$$

2) $v - 10 = -3$

$$\frac{+10 \quad +10}{\quad}$$

$$v = 7$$

3) $x - 3 = 4$

$$\frac{+3 \quad +3}{\quad}$$

$$x = 7$$

4) $\frac{x}{5} = 2$

$$x = 10$$

1) If $2x + 4 = 10$, what does $5x + 12 - 2x$ equal?

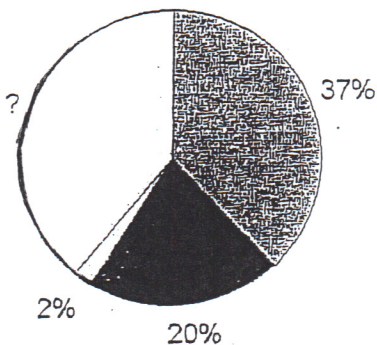
$$\begin{array}{r}
 2x + 4 = 10 \\
 -4 \quad -4 \\
 \hline
 2x = 6 \\
 x = 3
 \end{array}$$

$$\begin{array}{r}
 5x + 12 - 2x = \\
 15 + 12 - 6 = \\
 \hline
 21
 \end{array}$$

Answer: 21

2) The students of Buzz Lightyear Academy are going on a field trip to the museum. 37% of the students are going to the moon exhibit, 20% are going to the star command exhibit, 2% are going to see the space rocks, and the rest are going to the alien petting zoo. If 200 students went on the field trip, how many of the students went to the alien petting zoo?

$$37 + 20 + 2 = 59$$



$$\begin{array}{r}
 100 \\
 -59 \\
 \hline
 41
 \end{array}$$

$$\begin{array}{r}
 200 \\
 \times 0.41 \\
 \hline
 82
 \end{array}$$

Answer: 82

3) Peter Piper had a rectangular pickle patch that had an area of 176 ft.^2 (remember that area = length \times width). If one side of the garden is 22ft. long, how much fence will Peter Piper need to put around his patch?

$$22x = 176$$

$$\begin{array}{r}
 8 \\
 22 \overline{)176} \\
 \underline{176} \\
 0
 \end{array}$$

$$\begin{array}{r}
 22 \\
 22 \\
 8 \\
 8 \\
 \hline
 60
 \end{array}$$

Answer: 60

4) At Whatstthedillio Pet Store, 5 goldfish cost \$8.00, 2 hamsters cost \$12.50, and parrots cost \$53.00 each. If you bought 3 goldfish, 1 hamster, and 2 parrots, how much would it cost?

$$\begin{array}{r}
 1.60 \\
 5 \overline{)8} \\
 \underline{5} \\
 30
 \end{array}$$

$$\begin{array}{r}
 6.25 \\
 2 \overline{)12.50} \\
 \underline{12.50} \\
 0
 \end{array}$$

$$(3 \times 1.60) + 6.25 + (2 \times 53) = 117.05$$

Answer: 117.05

5. Add or subtract. Your final answer must be written as a mixed number.

$$\frac{5}{6} + \frac{2}{3} - (.6) + \frac{7}{10}$$

$$\frac{5}{6} + \frac{4}{6} - \frac{6}{10} + \frac{7}{10}$$

$$= \frac{9}{6} + \frac{1}{10} = \frac{45}{30} + \frac{3}{30} = \frac{48}{30} = \frac{8}{5} = 1\frac{3}{5}$$

$$\underline{1\frac{3}{5}}$$

6. Evaluate. (Remember $\Rightarrow 2^3$ means $2 \times 2 \times 2$)

$$\frac{4^3}{8} + \frac{8}{2^3} = \frac{64}{8} + \frac{8}{8} = 8 + 1 = 9$$

$$\underline{9}$$