

Name: KEY

DEVELOPING

Add/Sub: S1

One-Step Equations - Integers

- 1) Natalie buys organic almonds priced at \$77 from the grocery store. How much did she pay the cashier, if she received \$23 in change?

Let a = amount Natalie paid the cashier.

Then $a - 77 = 23$
 $\quad +77 \quad +77$

$a = 100 \rightarrow$ Natalie paid the cashier \$100.

- 2) Lara and Mae participated in a quiz contest. They scored 23 points in all. If Lara scored 9 points, how many points did Mae score?

Let p = # of points Mae scored.

Then $p + 9 = 23$
 $\quad -9 \quad -9$

$p = 14 \rightarrow$ Mae scored 14 points.

- 3) John was gifted a pack of crayons. He gave 13 crayons to his friend Rhea and was left with 11 crayons. How many crayons did the pack contain?

Let c = # of crayons in the pack.

Then $c - 13 = 11$
 $\quad +13 \quad +13$

$c = 24 \rightarrow$ The pack had 24 crayons in it.

- 4) Smith and his friends are gaming online on a popular website. An hour later, 6 friends go offline. Five of them continue playing. How many of them were gaming online initially?

Let p = # of people who were initially gaming online.

The $p - 6 = 5$
 $\quad +6 \quad +6$

$p = 11 \rightarrow$ There were initially 11 people gaming online.

- 5) Trevor takes up a test at school and completes it in an hour. The test has two sections. If he takes 35 minutes to complete the first section, how much time does he have left to complete the second section?

Let t = time (minutes) remaining to complete the 2nd part.

Then $t + 35 = 60$
 $\quad -35 \quad -35$

$t = 25 \rightarrow$ Trevor has 25 minutes to complete the 2nd part.

One-Step Equations - Integers

- 1) Jamie paid the rent well past the due date for the months of April, May and June. As a result, he had been charged a total of \$75 as late fee. How much did he pay as late fee per month?

Let p = amount (\$) Jamie paid each month (late fee).

Then $\boxed{\frac{3p}{3} = \frac{75}{3}}$

$p = 25 \rightarrow$ Jamie paid \$25 each month (late fee).

- 2) The kindergarten section of Lehigh Valley has 12 classrooms. If each classroom can accommodate 15 kids, how many kids can the kindergarten section accommodate in all?

Let s = # of students that can be accommodated.

Then $\boxed{\frac{s}{12} = 15}$ or $\boxed{\frac{s}{15} = 12}$

$s = 180 \rightarrow$ Kindergarten section can accommodate 180 students.

- 3) Juan sells raffle tickets at a charity event for \$6 each. How many tickets does he have to sell to make \$114?

Let n = # of tickets sold.

Then $\boxed{\frac{6n}{6} = \frac{114}{6}}$

$n = 19 \rightarrow$ Juan needs to sell 19 tickets.

- 4) Melanie works as a nanny and is paid \$14 per hour. If she puts in 40 hours of work in 7 days, how much does she earn in a week?

Let d = amount (\$) Melanie earns in a week.

Then $\boxed{\frac{d}{14} = 40}$ or $\boxed{\frac{d}{40} = 14}$

$d = 560 \rightarrow$ Melanie earns \$560 in a week.

- 5) The non-fiction section of the Montgomery County Library has 17 racks. If each rack holds 528 books, what is the total collection of non-fiction books in the library?

Let n = # of non-fiction books in the library.

Then $\boxed{\frac{n}{528} = 17}$ or $\boxed{\frac{n}{17} = 528}$

$n = 8976 \rightarrow$ There are 8976 non-fiction books in the library.

$$\begin{array}{r} 15 \\ \times 12 \\ \hline 30 \\ + 150 \\ \hline 180 \end{array}$$

$$\begin{array}{r} 19 \\ 6 \overline{) 114} \\ \underline{-6} \\ 54 \\ \underline{-54} \\ 0 \end{array}$$

$$\begin{array}{r} 14 \\ \times 40 \\ \hline 560 \end{array}$$

$$\begin{array}{r} 528 \\ \times 17 \\ \hline 3696 \\ + 5280 \\ \hline 8976 \end{array}$$

Two-Step Equations - Integers

- 1) Dalia bought a few swirl marbles and divided it equally among four of her friends and her brother, Jake. While playing, Jake lost 2 marbles and has only 7 marbles at present. Find how many marbles did Dalia buy in all.

Let $m = \#$ of marbles Dalia bought.

Then $\frac{m}{5} - 2 = 7$ $\rightarrow \frac{m}{5} = 9$ $\rightarrow m = 45$

$+2$ $+2$ $\times 5$ $\times 5$

Dalia bought 45 marbles.

- 2) A bus departed from New York at 11 pm with 44 passengers. An hour later, a few passengers got off at New Jersey. The number of passengers who boarded the bus at New Jersey were twice the number of passengers who got off the bus. If the bus has 50 passengers now, how many passengers got off at New Jersey?

Let $p = \#$ of passengers who got off at New Jersey.

Then $44 - p + 2p = 50$ $\rightarrow p = 6$

$44 + p = 50$
 -44 -44

\rightarrow Six passengers got off the bus at New Jersey

- 3) Clara lends half her collection of formal attires to her sister, Susan. Clara then buys four more attires. If she has 12 attires now, how many attires did Clara had initially?

Let $a = \#$ of attires Clara initially had.

Then $\frac{a}{2} + 4 = 12$ $\rightarrow \frac{a}{2} = 8$ $\rightarrow a = 16$

-4 -4 $\times 2$ $\times 2$

Clara initially had 16 attires.

- 4) The Rock Zoo nurses 37 species of big cats. Recently, a few species of big cats were sponsored to other zoos around the country. The zoo now nurses only 25 species. How many species of big cats were sponsored to other zoos?

Let $c = \#$ of species of big cats that were sponsored.

Then $37 - c = 25$ $\rightarrow \frac{-c}{-1} = \frac{-12}{-1}$ $\rightarrow c = 12$

-37 -37

The Rock Zoo sponsored 12 big cats to other zoos.

- 5) Megan and four of her friends plan to go for a long drive. She buys 12 bottles of frappe and a few bottles of orange juice from a supermarket. The total number of bottles they have are four times that of orange juice bottles. How many bottles of orange juice did Megan buy?

Let $j = \#$ of bottles of orange juice Megan bought.

Then $12 + j = 4j$ $\rightarrow 12 = 3j$ $\rightarrow 4 = j$

$-j$ $-j$ $\div 3$ $\div 3$

Megan bought 4 bottles of orange juice.

Two-Step Equations - Integers

- 1) Brad, a teenager, saves up his monthly allowance over a period of six months to buy a pair of high-resolution headphones. He lends his friend, Jorge \$10 from his savings. If Brad has \$272 now, calculate his monthly allowance.

Let $a =$ Brad's monthly allowance (\$)
 Then $\boxed{6a - 10 = 272}$ $\xrightarrow{+10 \quad +10}$ $\frac{6a}{6} = \frac{282}{6}$ $\xrightarrow{\quad}$ $a = 47$

Brad's monthly allowance is \$47.

- 2) Sam divided his salary equally into two. One part was saved for his family and the other part was for his expenses. He withdrew \$200 from his share to purchase a watch. If he has \$215 in his account now, calculate Sam salary.

Let $s =$ Sam's salary.

Then $\boxed{\frac{s}{2} - 200 = 215}$ $\xrightarrow{+200 \quad +200}$ $\frac{s}{2} = 415$ $\xrightarrow{\times 2 \quad \times 2}$ $s = 830$

Sam's salary is \$830.

- 3) A total of 750 students attended a conference at Avenel High school. The attendance of the number of girls was twice that of the number of boys. How many boys attended the conference?

Let $b =$ # of boys who attended the conference

Then $\boxed{b + 2b = 750}$ $\xrightarrow{\quad}$ $b = 250$
 $\frac{3b}{3} = \frac{750}{3}$

Two hundred and fifty boys attended the conference.

- 4) Ella bought two packs of blackberry juice for \$15 and three candy bars from a store. If her total purchase was worth \$45, how much did each candy bar cost?

Let $c =$ cost (\$) of each candy bar

Then $\boxed{15 + 3c = 45}$ $\xrightarrow{-15 \quad -15}$ $\frac{3c}{3} = \frac{30}{3}$ $\xrightarrow{\quad}$ $c = 10$

Each candy bar cost \$10.

- 5) Payton runs a kiosk on Route 66. Half the canned drinks in stock were sold out and empty cans were sent for recycling. Payton bought 68 more canned drinks to restock the kiosk. If there is a total of 200 cans now, how many canned drinks were in stock initially?

Let $c =$ # of cans that were initially stocked.

Then $\boxed{\frac{c}{2} + 68 = 200}$ $\xrightarrow{-68 \quad -68}$ $\frac{c}{2} = 132$ $\xrightarrow{\times 2 \quad \times 2}$ $c = 264$

There were 264 cans initially stocked.

Name: _____

EXTENDING

Multi-Step Equations - Integers

Sheet 2

- 1) Gina's mom filled a pinata with 45 lollypops, a few milk chocolates and peanut butter cups. The number of peanut butter cups in the pinata was twice the other types of candies. If there were 150 candies in all, how many milk chocolates were in the pinata?

Let m = # of milk chocolates.

$$\begin{aligned} \text{Then } \boxed{45 + m + 2(45 + m) = 150} &\rightarrow 135 + 3m = 150 \rightarrow \frac{3m}{3} = \frac{15}{3} \\ 45 + m + 90 + 2m = 150 &\rightarrow -135 \quad -135 \quad \rightarrow m = 5 \end{aligned}$$

There are 5 milk chocolates.

- 2) A ship departs from Port Miami with 5,678 tons of cargo. The ship docks at the Bahamas and unloads some cargo. The crew also loads three times the quantity of cargo that was unloaded. If the ship holds 8,588 tons now, how many tons of cargo did the ship unload at the Bahamas?

Let c = # of tons of cargo unloaded at the Bahamas.

$$\begin{aligned} \text{Then } \boxed{5678 - t + 3t = 8588} &\rightarrow \frac{2t}{2} = \frac{2910}{2} \rightarrow t = 1455 \\ 5678 + 2t = 8588 &\end{aligned}$$

The ship unloaded 1455 tons of cargo at the Bahamas.

- 3) In 2013, a State Library received a three-year grant to add 69,678 books to their collection. During a used book sale, the library sold 430 books. If the collection now is five times more than the original number of books, how many books did the library hold before it received the grant?

Let b = # of books library had before the grant.

$$\text{Then } \boxed{b + 69678 - 430 = 5b} \rightarrow \frac{69248}{4} = \frac{4b}{4} \rightarrow b = 17312$$

The library held 17,312 books before the grant.

- 4) Harriet gifts each of her friends a pack of markers that costs \$7 and 6 retractable pens. If she has 5 friends and has spent a total of \$95 on the gifts, calculate the price of each pen.

Let p = price (\$) of each pen.

$$\begin{aligned} \text{Then } \boxed{5(7 + 6p) = 95} &\rightarrow \frac{30p}{30} = \frac{60}{30} \rightarrow p = 2 \\ 35 + 30p = 95 &\end{aligned}$$

Each pen cost \$2.

- 5) The sum of three consecutive numbers is 141. Find the least and the greatest numbers in the series.

Let n = first number in the series.

$$\begin{aligned} \text{Then } \boxed{n + (n+1) + (n+2) = 141} &\rightarrow \frac{3n}{3} = \frac{138}{3} \rightarrow n = 46. \\ 3n + 3 = 141 &\end{aligned}$$

The least number is 46 and the greatest number is 48.