

Math Challenge #7

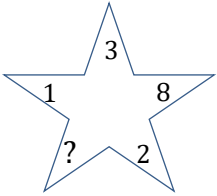


SOLUTIONS

Winter

Here are more math problems with winter theme. Enjoy the challenge!

Kinder & First Grade: solve at least 3 problems.
Second & Third Grade: solve at least 6 problems.
Fourth Grade and above: solve at least 12 problems.

<i>Problems</i>	<i>Answer</i>
<p>1. Andrew used huskies to pull his dog-sled. He left his village with 8 dogs pulling his sled. Along the way, he met his friend Simana. She had caught so many fish that day that her team of dogs couldn't pull the sled, so Andrew lent her 3 dogs. How many dogs did Andrew have left to pull his sled?</p>	5
<p>2.  What number is missing on the star so that the sum of all numbers is 19?</p>	5
<p>3. Kirill got a square box with 16 chocolate pieces in it for Christmas. It was neatly arranged in 4 rows of 4. On Christmas day, he ate every piece of chocolate along the sides of the box. How many chocolate pieces are still in the box?</p>	4 [pieces]
<p>4. On December 15th, Bellevue Ice Skating Arena was open from 2:30 p.m. till 11:00 p.m. How many hours was it open that day? <small>There are 8 hours from 2:30 to 10:30, therefore, there are 8.5 hours from 2:30 p.m. to 11 p.m. Or $23:00 - 14:30 = 22:60 - 14:30 = 8:30$ hours.</small></p>	8 ½ hours
<p>5. For the holiday party, Mr. Bing brought 80 cookies and gave his class of 28 students each 2 cookies. He later gave some of the remaining cookies to the school office and had 5 left for himself. How many cookies did he give to the school office? <small>After giving cookies to his class, he had $80 - (2 \times 28) = 24$ cookies. Since he had 5 cookies left, he must have given $24 - 5 = 19$ cookies to the school office.</small></p>	19
<p>6. Owen bought 8 candy canes. He gave the cashier \$2. He received change of a quarter, a dime and a nickel. What is the cost of each candy cane? <small>$\\$2.00 - \\$0.25 - \\$0.10 - \\$0.05 = 1.60$. Each candy cane costs: $\\$1.60 / 8 = \\0.20 or 20 cents</small></p>	\$0.20 or 20 cents
<p>7. Each day, a new row with an alternating pattern is added to the bottom of a Christmas tree. The tree will have the shape shown in the picture on the third day. How many green triangles will be in a tree at the end of the first week? <small>1 week has 7 days. Day 1: 1 green triangle. Day 2: 2 green triangles. Day 3: 3 green triangles, and so on. Day 7: $1 + 2 + 3 + 4 + 5 + 6 + 7 = 28$ green triangles</small></p>	28 green triangles



8.	Anna, John, Sarah, Carl, and Tim all made the finals of the National Winter Math Tournament last year. Before the final round began, each one had to shake hands with all the others. How many handshakes were there? <i>The number of handshakes: $4+3+2+1 = 10$.</i>	<i>10</i>
9.	Julie uses $\frac{1}{4}$ of package of icing to decorate Christmas cookies. She then uses $\frac{1}{9}$ of the remaining icing for decorating a gingerbread house. What fraction of the package of icing does she have left? <i>$1 - \frac{1}{4} = \frac{3}{4}$ of icing left after decorating cookies $\frac{1}{9} \times \frac{3}{4} = \frac{1}{12}$ used for gingerbread house $\frac{3}{4} - \frac{1}{12} = \frac{8}{12} = \frac{2}{3}$ of package of icing left</i>	<i>$\frac{2}{3}$ of package of icing</i>
10.	Bellevue Ice Skating Arena has the following prices: \$14 for 9 years old and above, \$10 for 8 years old and under. A party of 7 paid a total of \$86. How many kids were 8 years old and under in this party? <i>Let's pretend that all 7 kids were 9 and older. $7 \times \\$14 = 98$. Then we have $\\$98 - \\$86 = \\$12$ extra dollars. The difference between the tickets is \$4. $\\$12 \div \\$4 = 3$ kids of 8 years old and under. Or you can use guess and check strategy.</i>	<i>3 kids 8 and under</i>
11.	When throwing snowballs at each other Jaiden had an accuracy of $\frac{7}{15}$, Ben's was $\frac{3}{4}$ and Kevin's was $\frac{6}{12}$. Out of the three boys who was missing the targets the most? <i>We can compare fractions only with common denominator. Common denominator is 60. Out of 60 throws Jaiden will hit 28, Ben 45, Kevin 30. Thus, Jaiden missed the most ($60 - 28 = 32$ snowballs)</i>	<i>Jaiden</i>
12.	If an average 4 inches of snow fell every 5 days, how much snow in inches would have fallen during the months of December-February, assuming it's not a leap year? <i>December + January + February = $31+31+28 = 90$ days $90 \div 5 = 18$ periods of 5 days $18 \times 4 = 72$ inches</i>	<i>72 inches</i>
13.	Areeb went for a 5-mile cross-country jog. He finished his first 2 miles in 30 minutes and the rest of the way in 45 minutes. What was Areeb's average speed in miles per hour for this jog? <i>$30 \text{ min} + 45 \text{ min} = 1 \frac{1}{4}$ hour Average speed = $\frac{5 \text{ miles}}{1 \frac{1}{4} \text{ hour}} = 4 \text{ mph}$</i>	<i>4 mph</i>
14.	Speed skiing is a sport where skiers race downhill in a straight line as fast as they can. The current record holder is Simone Origone with the speed of 156.8 mph. Racing car Hennessey Venom F5 is claimed to have a speed of 301 mph. How much faster is Venom F5 than the fastest speed skier in miles per hour? <i>$301 - 156.8 = 144.2 \text{ mph}$</i>	<i>144.2 mph</i>
15.	Jessica bought a scarf for her mother. The scarf was on sale for $\frac{1}{3}$ off the marked price. The regular price of the scarf was \$36.00. How much will she pay for the scarf, including sales tax of 6%? <i>The sales price: $\\$36 - (\frac{1}{3} \times \\$36) = \\$24.00$. The cost of the scarf including tax: $\\$24.00 + (6\% \times \\$24) = \\$24.00 + \\$1.44 = \\$25.44$</i>	<i>\$25.44</i>
16.	A snowplow truck can clear 1 mile stretch of 1 lane road in 15 minutes. How long will it take to clear 4 lane Snoqualmie Pass 30 miles long? <i>$10 \text{ miles} \times 4 \text{ lanes} \times 15 \text{ min} = 600 \text{ min} = 10 \text{ hours for 10 miles, therefore 30 hours for 30 miles.}$</i>	<i>30 hours</i>



17.	<p>The Winter Olympics will be hold in PyeongChang on February 9-25, 2018. In 2014, there were 2,875 participants. For the 2018 Winter Olympics, they estimate a 20% increase in participation compared to 2014. How many participants are planning to compete at Winter Olympics 2018?</p> <p>$2,875 \times 1.2 = 3,450$ participants</p>	3,450 participants
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18.	<p>Peter walked to and from school on $\frac{3}{5}$ of the school days in one winter month. He took a school bus to and from school on $\frac{7}{8}$ of the remaining days. On the one remaining school day they had a field trip, but he couldn't go, because he was sick. What is the name of this winter month?</p> <p><u>Backwards problem</u></p> <p>The one day he was sick, which was $\frac{1}{8}$. Then he rode a school bus for 7 days to and from school. There were 8 days made up the $\frac{2}{5}$th of school days. Thus, there were 20 school days in that winter month.</p> <p>Every week there are 5 schooldays $\rightarrow 20 \div 5 = 4$ weeks. We have 8 weekend days, counting Saturday and Sunday. $20 + 8$ days = 28 days in a month.</p> <p>Therefore, the name of the winter month in this problem is February.</p>	February
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Solution is available on 1/19/2018 at www.mathinaction.org