

Math Challenge #6











First Name: _____	Last Name: _____	Grade: _____
Teacher: _____	Parent's email: _____	

Winter Math Problems


Welcome to the Math Challenge #6. When the weather gets cold, we enjoy drinking hot chocolates, making snowflakes, baking cookies, or playing in the snow! Enjoy this winter themed challenge.

Kinder & First Grade: solve at least 3 problems.
Second & Third Grade: solve at least 7 problems.
Fourth Grade and above: solve at least 12 problems.

		<i>Answer</i>
1.	 <p>Six out of the nine reindeer are ready to help Santa tonight. How many reindeer are not ready yet? $9 - 6 = 3$ reindeer</p>	<i>3 [reindeer]</i>
2.	$12 - 4 = 8$ hats 	<i>8 [hats]</i>
3.	 <p>Lara made 9 holiday cards for her friends, 2 for her sisters, and one for her teacher. How many total holiday cards did she make? $9 + 2 + 1 = 12$</p>	<i>12 [cards]</i>
4.	<p>Team A built: $2 + 7 = 9$ snowmen Team B built: $15 - 9 = 6$ snowmen</p> 	<i>6 [snowmen]</i>
5.	 $23 + 23 + 8 = 54$ cups	<i>54 [cups]</i>
6.	$30 - (6+5+7) = 12$ 	<i>12 [snowflakes]</i>
7.	<p>$\frac{1}{2}$ of 2 feet = 1 foot $\frac{1}{2}$ of 1 foot = $\frac{1}{2}$ foot 2 feet + 1 foot + $\frac{1}{2}$ foot = $3 \frac{1}{2}$ feet or 3.5 feet</p> 	<i>$3 \frac{1}{2}$ [feet] or 3.5 [feet]</i>
8.	<p>The pattern is skip counting by 4. To get to the tenth house we do 9 skips of 4. So, the number on the tenth house is $7 + 9 \times 4 = 43$</p>  <p>Or we can continue to write the pattern: 7, 11, 15, 19, 23, 27, 31, 35, 39, 43</p>	<i>43</i>

9. $\text{Penguin} + \text{Penguin} + \text{Snowflake} = 20$
 $\text{Penguin} \times \text{Snowman} - \text{Snowman} = 5$
 $\text{Snowflake} + \text{Snowflake} + \text{Snowflake} = 24$
 $\text{Penguin} \div (\text{Snowman} + \text{Snowman}) + \text{Snowflake} = \text{Bell}$

We can start by solving the value of a snowflake: $24 \div 3 = 8$
 Snowflake = 8
 Then we can find the value of a penguin: $(20 - 8) \div 2 = 6$
 Penguin = 6
 Snowman = 1
 2 snowmen = 2
 Bell = $6 \div 2 + 8 = 11$

 = 11

10. $12 \div 3 = 4$ sheets of paper for each type of snowflake
 $4 \times 3 = 12$ small snowflakes
 $4 \times 2 = 8$ medium snowflakes
 $4 \times 1 = 4$ large snowflakes
 $12 + 8 + 4 = 24$ snowflakes

24 [snowflakes]

11. There are multiple ways to approach this problem.
 One way is to look at the fourth row first:

$\text{Snowflake} + \text{Gift} + \text{Snowflake} + \text{Gift} = 16$

Then we know $\text{Snowflake} + \text{Gift} = 8$

We can then pick the first row to solve:

$\text{Gift} + \text{Gift} = 20 - 8$ $\text{Gift} = 6$
 $\text{Penguin} = (14 - 8) \div 2 = 3$ $\text{Snowflake} = 8 - 6 = 2$


				20
				14
				13
				16
14	20	16	13	

= 6
 = 3
 = 2

12. A full mug will have 360 ml of hot chocolate. When it's $\frac{4}{9}$ full, it has $\frac{4}{9} \times 360 \text{ ml} = 160 \text{ ml}$.
 A $\frac{2}{3}$ full mug will have $\frac{2}{3} \times 360 \text{ ml} = 240 \text{ ml}$.
 To make it $\frac{2}{3}$ full, we need to fill $240 - 160 = 80 \text{ ml}$ more hot chocolate.
 Another way:
 $\frac{2}{3} = \frac{6}{9}$ of the mug, now it is only $\frac{4}{9}$ full. So, we need to add $\frac{2}{9}$ of 360 ml, which is **80 ml**.


80 [ml]

13. Rudolph's number: x
 Dasher's number: x^2
 Dancer's number: $2x^2$
 Prancer's number: $\frac{3}{5}$ of $2x^2$
 The only way for Prancer to have a whole number is to have $2x^2$ as a multiple of 5. Thus, Rudolph chose 5.
 Rudolph's number: 5
 Dasher's number: 25
 Dancer's number: 50
 Prancer's number: $\frac{3}{5}$ of $50 = 30$
 The other 5 reindeer choose number that have a mean of 8. That means the total of these numbers is $8 \times 5 = 40$
 Total number: $5 + 25 + 50 + 30 + 40 = 150$






150

14. $\frac{1}{2} + \frac{1}{4} + \frac{1}{3} + \frac{1}{6} = 1 \frac{1}{4}$
 $1 \frac{1}{4}$ of the cracker equals \$30. Thus, one cracker hold $30 \times \frac{4}{5} = \24



\$24

<p>15. Cotton: 12, 24, 36, 48, 60, 72 Buddy: 16, 32, 48, 64, 80 At 48 minutes, they will complete a toy at the same time. 48 minutes after 8:30 am is 9:18 am OR LCM(12, 16) = 48, so 8:30 am + 0:48 = 9:18 am</p>	 <p>9:18 a.m.</p>
<p>16. 2.5 minutes = 150 seconds $200/150 = 1.33\dots \approx \mathbf{1.33 \text{ miles per second}}$</p>	<p>1.33 [miles per second]</p>
<p>17. $3/4 = 9/12$ $1 - 9/12 - 1/12 = 2/12$ or $1/6$ Since $1/6$ represents \$84, $6/6$ or 1 whole is $\\$6 \times \\$84 = \\$504$ OR do the model drawing</p>  <p>1 unit is $\\$84 \div 2 = \\42 Money in the beginning $\\$42 \times 12 = \mathbf{\\$504}$</p>	<p>[\$]504.00</p>
<p>18. Area of the snowman's head = $\pi \cdot r^2 = 100\pi = 314 \text{ cm}^2$ Area of the snowman's body = $1.69 \times 314 = 530.66 = \pi R^2$ Radius of the body is $\sqrt{530.66 \div 3.14} = \sqrt{169} = 13 \text{ cm}$</p>  <p>Head <input type="text"/> Body <input type="text"/> +69%</p>	<p>13 [cm]</p>

Solution is available on January 7, 2022, at www.mathinaction.org

Congratulations to all Math Challenge Participants!