

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

5<sup>th</sup> Grade Problem Solving – Round 1

1.	Zach and Nick were visiting New York City with their parents and got lost. Zach said to Nick, “When we were at the Empire State Building we were 8 blocks west of the hotel.” Nick remembered that after they left the Empire State Building they went south for four blocks, then east for three blocks, north for two more blocks, then east for five blocks. How far away from the hotel are the brothers when they realize they are lost?	_____ blocks south
2.	A box measures 12” x 4” x 3”. What is the volume of the box if you double one of its sides?	_____ cubic inches
3.	<ul style="list-style-type: none"><li>* I am a 4-digit even number.</li><li>* I am less than 2500.</li><li>* The digits in my hundreds and tens places are different from each other.</li><li>* The digits in my hundreds and tens places are less than the digit in the thousands place.</li><li>* The sum of my digits in the ones and tens places equals 9.</li></ul> <b>What number am I?</b>	_____
4.	The perimeter of one square is twice that of another. If the side of the larger square is 6 cm. long, what is the area of the smaller square?	_____ square inches

Team Number \_\_\_\_\_

Score \_\_\_\_\_ / 40 (2)

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

5<sup>th</sup> Grade Problem Solving – Round 2

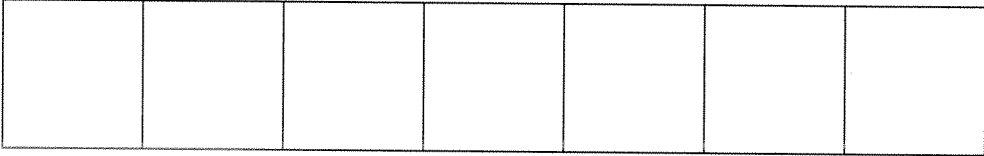
1.	<p>The rules for this year's art contest were: The design must contain squares, triangles, hexagons, and parallelograms. For every 10 squares in the design, there must be 6 triangles, 4 hexagons, and 2 parallelograms. Pierre and Monique constructed a design with a total of 242 pieces. How many hexagons pieces did they use?</p>	<p>_____</p> <p>hexagons</p>
2.	<p>A small, strange airship landed and soon tiny creatures were climbing out of the airship. There were two kinds of creatures: purple creatures with two antennas and blue creatures with pink feet and one large antenna. Altogether there were 23 creatures with 35 antennae. How many blue creatures climbed out of the airship?</p>	<p>_____</p> <p>blue creatures</p>
3.	<p>If you could fold a sheet of paper in half 10 times, how many layers of paper would be on top of each other?</p>	<p>_____</p> <p>layers</p>
4.	<p>Write the number 121 as the sum of 4 different perfect square numbers.</p>	<p>___ + ___ + ___ + ___</p>

Team Number \_\_\_\_\_

Score \_\_\_\_\_ /40 (6)

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

6<sup>th</sup> Grade Problem Solving – Round 1

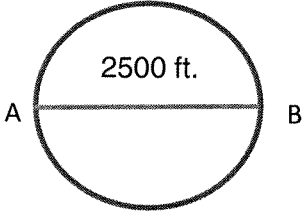
1.	My dog walked 10 times as far as Frank's dog, and Frank's dog walked 10 times as far as Al's dog. If Frank's dog walked 10 km, then how much farther did my dog walk than Al's dog?	_____ km
2.	When a square piece of paper is folded in half vertically, the resulting rectangle has a perimeter of 39 cm. What is the area of the original square sheet of paper?	_____ square cm.
3.	How many rectangles appear in the figure below? 	_____ rectangles
4.	Kishmar is making a pepperoni pizza and is using a 12 in. x 16 in. rectangular pan. Ryan wants to make a circular pizza that is the same thickness and uses the same amount of dough as Kishmar's pizza. Determine the diameter of Ryan's pan. Note: Use the approximation <u>3</u> for $\pi$ .	_____ inches

Team Number \_\_\_\_\_

Score \_\_\_\_\_/40  
(4)

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

6<sup>th</sup> Grade Problem Solving – Round 2

1.	<p>Kyle needs to walk from point A to point B on a circular farm field. He is worried about bulls being in the field, so he is thinking about walking along the perimeter instead of the diameter of the field. How much farther will Kyle travel if he decides to walk around the field instead of through it? (Use 3.14 as the approximation for pi.)</p> 	<p>_____</p> <p>feet</p>
2.	<p><b>What four-digit number am I?</b></p> <ul style="list-style-type: none"> <li>• All the digits are different.</li> <li>• The digit in the thousands place is 3 times the digit in the tens place.</li> <li>• The number is odd.</li> <li>• The sum of the digits is 27.</li> </ul>	<p>_____</p>
3.	<p>A frog ate 104 bugs in 4 days. Each day the frog ate 10 more bugs than the day before. How many bugs did the frog eat on the third day?</p>	<p>_____</p> <p>bugs</p>
4.	<p>Monique's five test scores have a mean of 69. The median is 83, and the mode is 85. If the range of the five scores is 70, find the value of the second lowest test score.</p>	<p>_____</p>

Team Number \_\_\_\_\_

Score \_\_\_\_\_/40  
⑧

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

**Number Sense**

Individual Student Response Sheet,

Optional Work Area

Answer

	1. _____
	2. \$ _____.
	3. _____
	4. _____
	5. _____ sq. ft.
	6. _____
	7. _____
	8. _____
	9. _____ cm
	10. _____

Team Number \_\_\_\_\_

Score \_\_\_\_\_

over  
9a

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

***Number Sense***

Individual Student Response Sheet,

Optional Work Area

Answer

	11. \$ _____.
	12. _____
	13. _____
	14. _____ mins.
	15. _____
	16. _____ hrs. _____ mins.
	17. _____
	18. \$ _____.
	19. _____
	20. \$ _____.

Team Number \_\_\_\_\_

Score \_\_\_\_\_  
20

96

**GCCTM Problem Solving Tournament**  
**Gr. 5/6**  
**Team Construction Activity**

**2013**

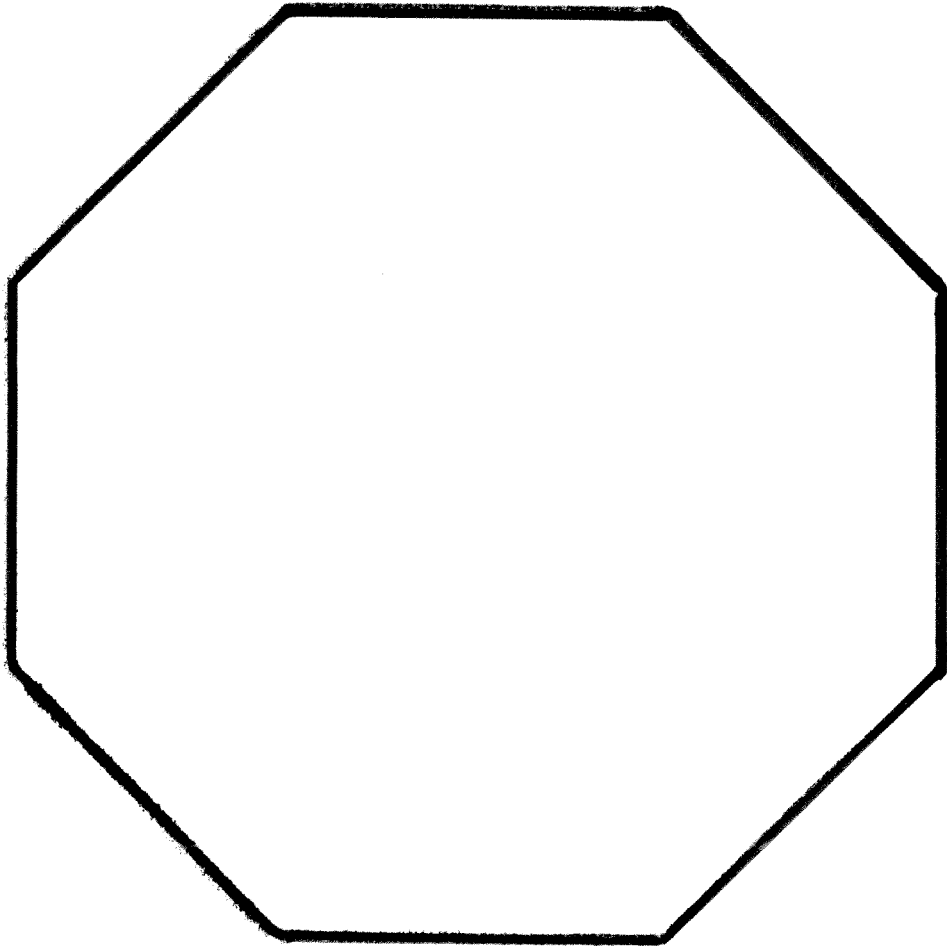
2 per team

On your paper is a regular octagon.

1. Draw a line segment that divides the regular octagon in half so that the halves are congruent, irregular hexagons.
2. Label the endpoints of your line segment 'A' and 'B'.
3. Determine the center point of the octagon and label it 'C'.
4. Divide one of your halves into the following 5 polygons. Each of these 5 polygons must have one vertex on point 'C'.
  - a. 3 congruent isosceles triangles each covering  $1/8$  of the whole octagon
  - b. 2 congruent scalene triangles each covering  $1/16$  of the whole octagon.
5. Divide the other half of the octagon into the following 2 polygons. Each of these 2 polygons must have one vertex on point 'C'.
  - a. 2 congruent irregular pentagons each covering 25% of the whole octagon

Extra folds are acceptable, but extra working marks should be erased before submitting your final copy.

*80 points possible*



Team \_\_\_\_\_

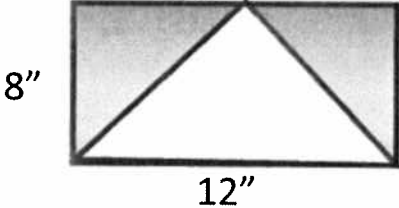
80 pts.

(13)



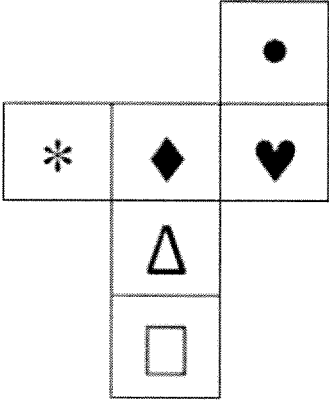
Greater Cleveland Council of Teachers of Mathematics  
 5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

5<sup>th</sup> Grade Pile of Ten

1.	At the picnic, Taylor swallowed one of every six seeds in her slice of watermelon. How many of the 162 seeds in her slice of watermelon did she swallow?	_____ seeds
2.	What is the area of the shaded region of the 8" x 12" rectangle shown?  	_____ square inches
3.	What is the next number in this sequence?  4, 5, 8, 13, 20, 29, _____	_____
4.	Jody's favorite clothes include four T-shirts, three pairs of designer jeans, and two pairs of sandals. How many days in a row could she wear a different outfit (1 of each item) using her favorite clothes?	_____ days
5.	One-fifth of the children in Miss Baker's class had perfect attendance records. But 28 of the children did not have perfect attendance records. How many children were in the class?	_____ children

Team Number \_\_\_\_\_

Greater Cleveland Council of Teachers of Mathematics  
 5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

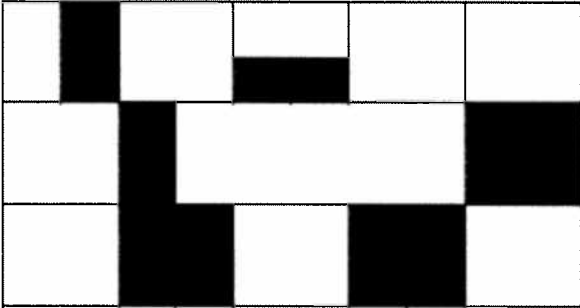
6.	<p>* The digit in my tens place is greater than 5, but less than 9.                  * The tens digit is twice as much as the ones digit.                  * Both of my digits are divisible by 3.  <b>What is my number?</b></p>	_____
7.	<p>If the figure shown were folded to form a cube what symbol would be across from the circle?</p> 	_____
8.	<p>Ellen has season tickets to the ballpark. Her seat is in section 22. The row is second from the front and eighth from the back. Each row seats 15 people. How many seats are in section 22?</p>	_____ seats
9.	<p>Last summer at camp it rained 2 days out of every 5 days. At that rate, how many days should it rain this year if camp lasts 30 days?</p>	_____ days
10.	<p>Ted has 8 coins (quarters, nickels, and dimes). He has the same number of quarters as dimes. He has \$1.15. How many nickels does he have?</p>	_____ nickels

Team Number \_\_\_\_\_

Score \_\_\_\_\_

80 (16b)

6th Grade Pile of Ten

1.	<p>What percentage of the figure shown is shaded?</p> 	_____
2.	<p>Maurice says that <math>\frac{5}{6}</math> of <math>\frac{3}{4}</math> equals <math>\frac{1}{2}</math> of a number. What is the number?</p>	_____
3.	<p>How many three-digit numbers can you create using only 6, 7, 8, and 9 if each digit cannot be repeated in any three-digit number and all digits must be different? Note: 678 and 687 are different three-digit numbers.</p>	_____
4.	<p>There are 13 two-digit multiples of 7. Find the sum of all two-digit multiples of 7 whose digits add up to a prime number.</p>	_____
5.	<p>Jeff has fewer than 30 marbles.                  When he puts them in piles of 3 he has no marbles left over.                  When he puts them in piles of 2 he has 1 left.                  When he puts them in piles of 5 he has 1 left.  <b>How many marbles does Jeff have?</b></p>	_____ marbles

Team Number \_\_\_\_\_

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

6.	Harry took $\frac{2}{3}$ of a pizza but could eat only half of his portion. Jasmine took $\frac{1}{2}$ of a pizza but could eat only two-thirds of her portion. Who, if either, ate more pizza?	_____
7.	Mark's usual biscuit recipe calls for $2\frac{1}{2}$ cups of flour. He wants to make $1\frac{1}{2}$ times his usual recipe. How many cups of flour will he use?	_____ cups
8.	On the hour, a clock chimes the number of hours shown. It also chimes once on the half hour. How many times does it chime in 24 hours?	_____ times
9.	Callie has a favorite number. The sum of her favorite number and $\frac{1}{2}$ her favorite number, and $\frac{1}{4}$ of her favorite number is 35. What is Callie's favorite number?	_____
10.	A mother has nine children. All of the children were born three years apart. The mother was nineteen years old when the first child was born and now the youngest child is nineteen. How old is the mother now?	_____ years old

Team Number \_\_\_\_\_

Score \_\_\_\_\_  
80 <sup>over</sup> (186)

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

5<sup>th</sup> Grade Problem Solving – Round 1

Answers

1.	Zach and Nick were visiting New York City with their parents and got lost. Zach said to Nick, “When we were at the Empire State Building we were 8 blocks west of the hotel.” Nick remembered that after they left the Empire State Building they went south for four blocks, then east for three blocks, north for two more blocks, then east for five blocks. How far away from the hotel are the brothers when they realize they are lost?	<u>2</u> blocks south
2.	A box measures 12” x 4” x 3”. What is the volume of the box if you double one of its sides?	<u>288</u> cubic inches
3.	<ul style="list-style-type: none"><li>* I am a 4-digit even number.</li><li>* I am less than 2500.</li><li>* The digits in my hundreds and tens places are different from each other.</li><li>* The digits in my hundreds and tens places are less than the digit in the thousands place.</li><li>* The sum of my digits in the ones and tens places equals 9.</li></ul> <p><b>What number am I?</b></p>	<u>2018</u>
4.	The perimeter of one square is twice that of another. If the side of the larger square is 6 cm. long, what is the area of the smaller square?	<u>9</u> square inches

Team Number \_\_\_\_\_

Score \_\_\_\_\_

40

19

Greater Cleveland Council of Teachers of Mathematics  
 5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

5<sup>th</sup> Grade Problem Solving – Round 2

Answers

1.	<p>The rules for this year's art contest were: The design must contain squares, triangles, hexagons, and parallelograms. For every 10 squares in the design, there must be 6 triangles, 4 hexagons, and 2 parallelograms. Pierre and Monique constructed a design with a total of 242 pieces. How many hexagons pieces did they use?</p>	<p><b><u>44</u></b> hexagons</p>
2.	<p>A small, strange airship landed and soon tiny creatures were climbing out of the airship. There were two kinds of creatures: purple creatures with two antennas and blue creatures with pink feet and one large antenna. Altogether there were 23 creatures with 35 antennae. How many blue creatures climbed out of the airship?</p>	<p><b><u>11</u></b> blue creatures</p>
3.	<p>If you could fold a sheet of paper in half 10 times, how many layers of paper would be on top of each other?</p>	<p><b><u>1024</u></b> layers</p>
4.	<p>Write the number 121 as the sum of 4 different perfect square numbers.</p>	<p><b><u>100 + 16</u></b> <b><u>+4 + 1</u></b></p>

Team Number \_\_\_\_\_

Score \_\_\_\_\_

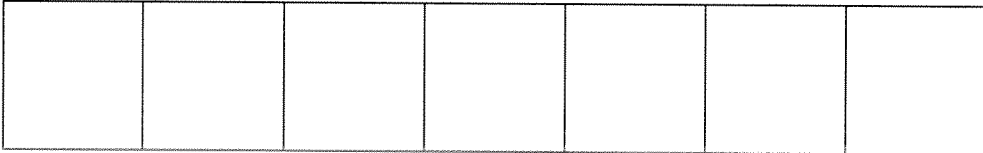
40

(21)

Greater Cleveland Council of Teachers of Mathematics  
 5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

6<sup>th</sup> Grade Problem Solving – Round 1

*Answers*

1.	My dog walked 10 times as far as Frank’s dog, and Frank’s dog walked 10 times as far as Al’s dog. If Frank’s dog walked 10 km, then how much farther did my dog walk than Al’s dog?	<p style="text-align: center;"><b><u>99</u></b> km</p>
2.	When a square piece of paper is folded in half vertically, the resulting rectangle has a perimeter of 39 cm. What is the area of the original square sheet of paper?	<p style="text-align: center;"><b><u>169</u></b> square cm.</p>
3.	How many rectangles appear in the figure below? 	<p style="text-align: center;"><b><u>28</u></b> rectangles</p>
4.	Kishmar is making a pepperoni pizza and is using a 12 in. x 16 in. rectangular pan. Ryan wants to make a circular pizza that is the same thickness and uses the same amount of dough as Kishmar’s pizza. Determine the diameter of Ryan’s pan. Note: Use the approximation <u>3</u> for $\pi$ .	<p style="text-align: center;"><b><u>16</u></b> inches</p>

Team Number \_\_\_\_\_

Score \_\_\_\_\_

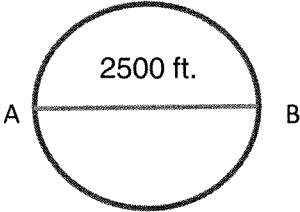
40

20

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

6<sup>th</sup> Grade Problem Solving – Round 2

*Answers*

1.	<p>Kyle needs to walk from point A to point B on a circular farm field. He is worried about bulls being in the field, so he is thinking about walking along the perimeter instead of the diameter of the field. How much farther will Kyle travel if he decides to walk around the field instead of through it? (Use 3.14 as the approximation for pi.)</p> 	<p><b><u>1425</u></b> <b>feet</b></p>
2.	<p><b>What four-digit number am I?</b></p> <ul style="list-style-type: none"> <li>• All the digits are different.</li> <li>• The digit in the thousands place is 3 times the digit in the tens place.</li> <li>• The number is odd.</li> <li>• The sum of the digits is 27.</li> </ul>	<p><b><u>9837</u></b></p>
3.	<p>A frog ate 104 bugs in 4 days. Each day the frog ate 10 more bugs than the day before. How many bugs did the frog eat on the third day?</p>	<p><b><u>31</u></b> <b>bugs</b></p>
4.	<p>Monique's five test scores have a mean of 69. The median is 83, and the mode is 85. If the range of the five scores is 70, find the value of the second lowest test score.</p>	<p><b><u>77</u></b></p>

Team Number \_\_\_\_\_

Score \_\_\_\_\_

40

(22)



Greater Cleveland Council of Teachers of Mathematics  
 5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - 2013  
 Individual **Number Sense**

Read-Aloud  
for Reader

FOLD  
BACK

\*Before reading aloud, reader should **fold back answer column**.

Announce to students that **only the answers written next to the numbers in the answer column** will be scored.

They may write in the work area, but their work will not be scored.

Read each problem clearly and slowly **one time**. Allow 10 seconds for students to record their answer.

Answers

1. "How many four-eighths are in 12 wholes?"	1. <u>24</u>
2. "Forty-six quarters would be how much money?"	2. \$ <u>11.50</u>
3. "What is the <i>median</i> of the following numbers? 42, 50, 44, 48, 47"	3. <u>47</u>
4. "What is the <i>mean</i> of the following numbers? 42, 50, 44, 48, 46 "	4. <u>46</u>
5. "How many square feet would cover two square yards?"	5. <u>18</u>
6. "What is 6,060 divided by 12? "	6. <u>505</u>
7. "What is three-fifths written as a decimal? "	7. <u>0.6</u> or equivalent
8. "What is the fifth multiple of 6? "	8. <u>30</u>
9. "What is the perimeter of a rectangular board that is 134 cm. long and 16 cm. wide? "	9. <u>300</u> cm
10. "What is 123 and 5 tenths divided by 5 tenths? "	10. <u>247</u>

Team Number \_\_\_\_\_

Score (10)

23a

Greater Cleveland Council of Teachers of Mathematics  
 5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**  
 Individual **Number Sense**

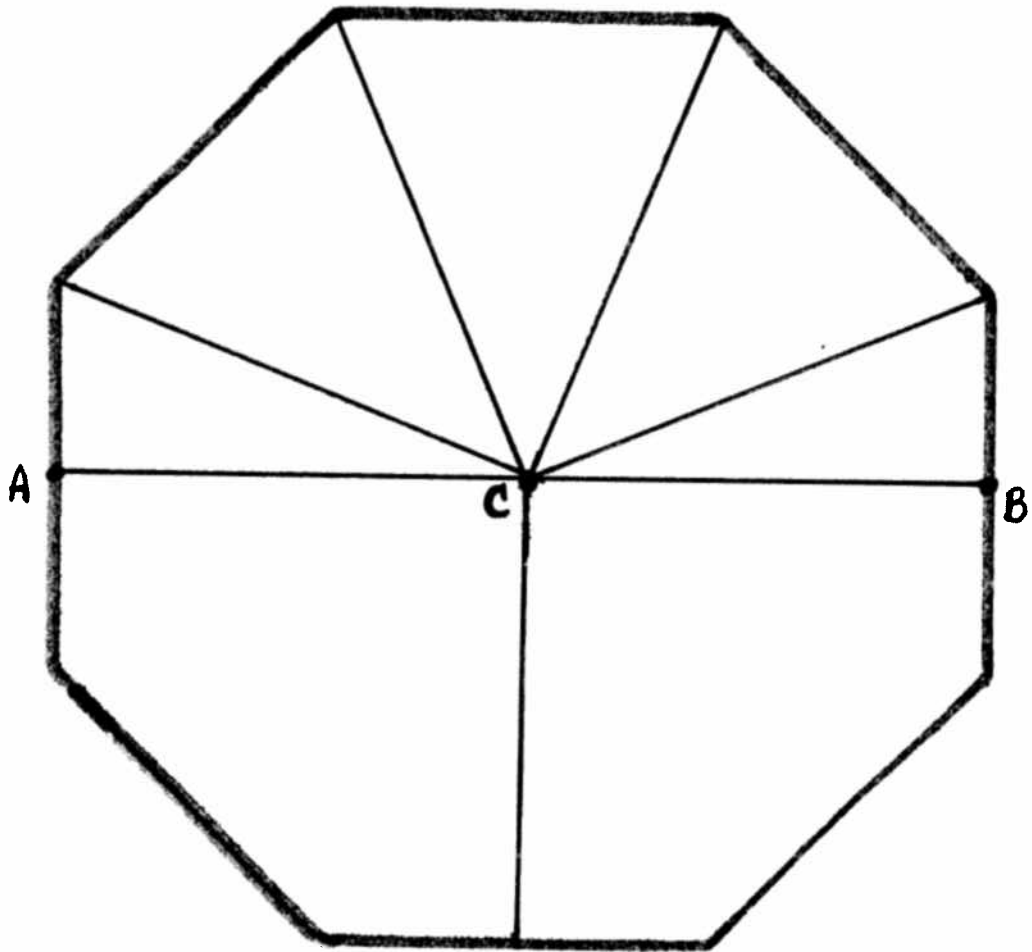
FOLD  
BACK

11. "From \$40 dollars, how much change would you get back after you purchase something for 26 dollars and 84 cents?"	11. \$ <u>13.16</u>
12. "List all of the square numbers between 50 and 70."	12. <u>64</u>
13. "What is three-sixteenths, plus seven-eighths, plus five-fifths, plus four-halves?"	13. <u>4<math>\frac{1}{16}</math></u> or equivalent
14. "How many minutes are in 39 hours?"	14. <u>2340</u>
15. "List all of the factors of 324 that are between 0 and 5."	15. <u>1, 2, 3, 4</u>
16. "A field trip begins at 8:45 a.m. and ends at 1:20 p.m. How long is the field trip?"	16. <u>4 hrs. 35 mins.</u>
17. "What is 25, times 50, times 4?"	17. <u>5000</u>
18. "What is two-fifths of 35 dollars and 10 cents?"	18. \$ <u>14.04</u>
19. "What is two and three-twelfths minus nine-fourths?"	19. <u>0</u>
20. "What is forty percent of \$20.00?"	20. \$ <u>8.00</u>

Team Number \_\_\_\_\_

Score 20

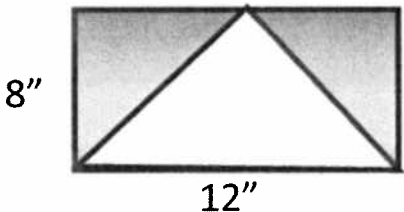
236



Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

5<sup>th</sup> Grade Pile of Ten

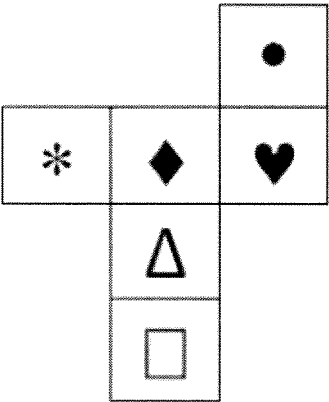
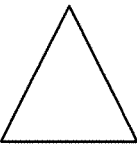
*Answers*

1.	At the picnic, Taylor swallowed one of every six seeds in her slice of watermelon. How many of the 162 seeds in her slice of watermelon did she swallow?	<u><b>27</b></u> seeds
2.	What is the area of the shaded region of the 8" x 12" rectangle shown? 	<u><b>48</b></u> square inches
3.	What is the next number in this sequence? 4, 5, 8, 13, 20, 29, _____	<u><b>40</b></u>
4.	Jody's favorite clothes include four T-shirts, three pairs of designer jeans, and two pairs of sandals. How many days in a row could she wear a different outfit (1 of each item) using her favorite clothes?	<u><b>24</b></u> days
5.	One-fifth of the children in Miss Baker's class had perfect attendance records. But 28 of the children did not have perfect attendance records. How many children were in the class?	<u><b>35</b></u> children

Team Number \_\_\_\_\_

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

Answers

6.	<p>* The digit in my tens place is greater than 5, but less than 9. * The tens digit is twice as much as the ones digit. * Both of my digits are divisible by 3. <b>What is my number?</b></p>	<p><b><u>63</u></b></p>
7.	<p>If the figure shown were folded to form a cube what symbol would be across from the circle?</p> 	<p><b><u>triangle</u></b></p> <p>or</p> 
8.	<p>Ellen has season tickets to the ballpark. Her seat is in section 22. The row is second from the front and eighth from the back. Each row seats 15 people. How many seats are in section 22?</p>	<p><b><u>135</u></b> <u>seats</u></p>
9.	<p>Last summer at camp it rained 2 days out of every 5 days. At that rate, how many days should it rain this year if camp lasts 30 days?</p>	<p><b><u>12</u></b> days</p>
10.	<p>Ted has 8 coins (quarters, nickels, and dimes). He has the same number of quarters as dimes. He has \$1.15. How many nickels does he have?</p>	<p><b><u>2</u></b> nickels</p>

Team Number \_\_\_\_\_

Score \_\_\_\_\_

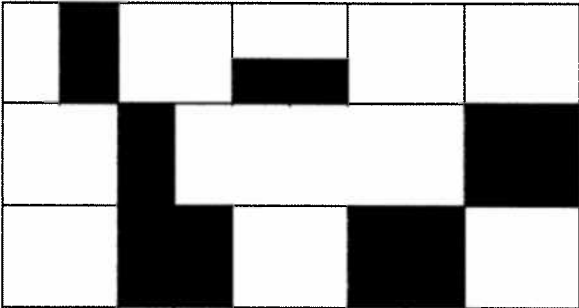
80

276

Greater Cleveland Council of Teachers of Mathematics  
5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

6th Grade Pile of Ten

Answers

1.	<p>What percentage of the figure shown is shaded?</p> 	<u>30</u>
2.	<p>Maurice says that <math>\frac{5}{6}</math> of <math>\frac{3}{4}</math> equals <math>\frac{1}{2}</math> of a number. What is the number?</p>	<p><u><math>1\frac{1}{4}</math></u> or equiv.</p>
3.	<p>How many three-digit numbers can you create using only 6, 7, 8, and 9 if each digit cannot be repeated in any three-digit number and all digits must be different? Note: 678 and 687 are different three-digit numbers.</p>	<u>24</u>
4.	<p>There are 13 two-digit multiples of 7. Find the sum of all two-digit multiples of 7 whose digits add up to a prime number.</p>	<u>308</u>
5.	<p>Jeff has fewer than 30 marbles. When he puts them in piles of 3 he has no marbles left over. When he puts them in piles of 2 he has 1 left. When he puts them in piles of 5 he has 1 left. <b>How many marbles does Jeff have?</b></p>	<p><u>21</u> marbles</p>

Team Number \_\_\_\_\_

Greater Cleveland Council of Teachers of Mathematics  
 5<sup>th</sup> and 6<sup>th</sup> Grade Problem Solving Tournament - **2013**

Answers

6.	Harry took $\frac{2}{3}$ of a pizza but could eat only half of his portion. Jasmine took $\frac{1}{2}$ of a pizza but could eat only two-thirds of her portion. Who, if either, ate more pizza?	<u>Neither</u> or <u>Both ate same amt.</u>
7.	Mark's usual biscuit recipe calls for $2\frac{1}{2}$ cups of flour. He wants to make $1\frac{1}{2}$ times his usual recipe. How many cups of flour will he use?	<u><math>3\frac{3}{4}</math></u> cups
8.	On the hour, a clock chimes the number of hours shown. It also chimes once on the half hour. How many times does it chime in 24 hours?	<u>180</u> times
9.	Callie has a favorite number. The sum of her favorite number and $\frac{1}{2}$ her favorite number, and $\frac{1}{4}$ of her favorite number is 35. What is Callie's favorite number?	<u>20</u>
10.	A mother has nine children. All of the children were born three years apart. The mother was nineteen years old when the first child was born and now the youngest child is nineteen. How old is the mother now?	<u>62</u> years old

Team Number \_\_\_\_\_

Score \_\_\_\_\_

80

286