

5th Grade Problem Solving, Round 1

1.	In a far-off land, three fish can be traded for two loaves of bread, and a loaf of bread can be traded for four bags of rice. How many bags of rice is one fish worth?	
2.	A family took a trip to Pittsburgh from Cleveland. Their average speed was 60 mph and the trip took 3 ½ hours. What is the distance between the two cities?	
3.	Jake won his school's annual (Pi) π Day contest by memorizing and reciting 5,005 digits of the number π . If each digit takes approximately 0.5 second to pronounce, how much time did Jake need to recite all 5,005 digits? Express your answer in minutes rounded to the nearest hundredth.	
4.	Kyle drove from Chicago to New York, which is 630 miles. The first 450 miles were driven at an average speed of 60 mph. Because of engine problems, the remaining distance was driven at an average speed of 45 mph. How long did Kyle's trip take?	

TEAM NUMBER _____

SCORE _____ / 40

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

6th Grade Problem Solving, Round 1

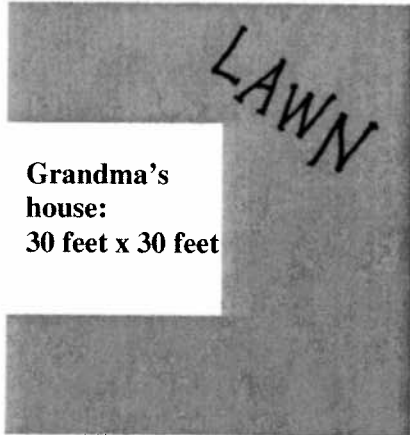
1.	If you have two numbers and add the first number to 4 times the second, you would get 30. If the second number is added to 4 times the first, you would get 15. What are the two numbers?	
2.	Kyle drove from Chicago to New York, which is 630 miles. The first 450 miles were driven at an average speed of 60 mph. Because of engine problems, the remaining distance was driven at an average speed of 45 mph. How long did Kyle's trip take?	
3.	A model of an Egyptian pyramid has a scale of 1.2 inches:38 feet. If the height of the model is 3 inches, what is the height of the real pyramid?	
4.	Marilyn had a bag of gold coins. She gave $\frac{1}{8}$ of them to her mother and then gave $\frac{1}{2}$ of what was left to her brother. She then gave $\frac{2}{7}$ of what was left to her dad. If she then had 25 coins left, how many did she have originally?	

TEAM NUMBER _____

SCORE _____/40

④

5th Grade Problem Solving, Round 2

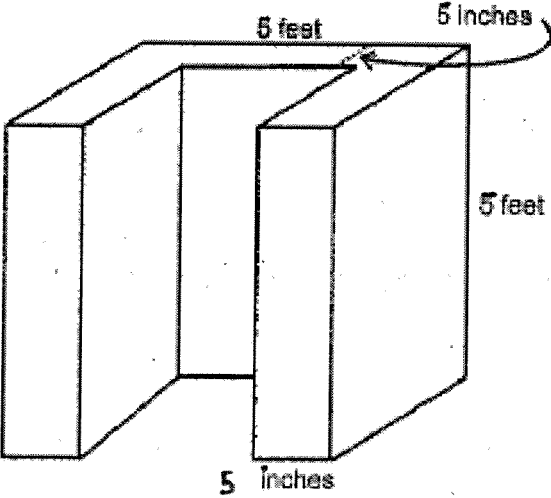
1.	<p>It takes Bobby 1 hour and 30 minutes to mow his grandma's lawn, which is shown in the diagram. If Bobby mows at the same rate, how long will it take to mow his uncle's field, which has an area of 3,600 square feet? Express your answer in hours and minutes.</p>	 <p>him</p>	
2.	<p>A board that is $15 \frac{3}{4}$ feet long is going to be cut into shelves that will be $2 \frac{1}{4}$ feet long. How many shelves will there be?</p>		
3.	<p>There are 140 people who want to cross a river. Boat A holds 18 people. Boat B holds 12 people. Boat C holds 5 people. How many round trips are needed if each boat makes the same number of trips?</p>		
4.	<p>A mother drinks eight 8-ounce glasses of filtered water per day, a father drinks five 8-ounce glasses per day, and their child drinks three 8-ounce glasses per day. If they change their filter every 60 gallons, how many days will each filter last?</p>		

TEAM NUMBER _____

SCORE _____ / 40

6

6th Grade Problem Solving, Round 2

1.	A board that is 16 feet long is going to be cut into shelves, each measuring exactly $2\frac{1}{4}$ feet long. How many of these shelves will there be?	
2.	A farmer at a local market sells much of his produce for \$1.50 per pound. A customer first selects eggplant, spinach, and red-leaf lettuce, for a total cost of \$12. This indecisive customer then asks to leave off the lettuce, for a total of \$10.50. Then the customer finally puts the lettuce back in and removes half of the eggplants and pays a total of \$8.25. How many pounds of eggplant did the customer end up taking home?	
3.	Connie has an 18-point average in 16 basketball games. How many points does she need to average in the next 4 games to get her average up to 20 points?	
4.	Alexandra wants to build a snow fort using packed snow. The fort will be 5 feet tall (with no roof). Each side wall will be 5 inches thick and 5 feet wide. How much snow will Alexandra need to build the fort? Express your answer in cubic inches.	

TEAM NUMBER _____

SCORE _____

40

8

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

5th & 6th Grade – Number Sense

1 per student

1.	Bob weighs 100 pounds. If Al weighs 80% more than Bob , and Carl weighs 50% more than Bob , then how much do Al and Carl weigh?	
2.	One pizza and 1 bottle of soda are enough for 6 students. How many pizzas and bottles of soda are needed for a party for 50 students?	
3.	What is the smallest 4-digit whole number that is divisible by 9?	
4.	Write two fractions whose sum is $\frac{7}{10}$ and whose numerators are one.	
5.	What is the product of the 5 smallest whole numbers?	
6.	I am a 2-digit number that is both a square and a cube. Who am I?	
7.	The sum of my 2 digits is the same as the product of my digits. What number am I?	
8.	600% of one hour equals what percent of one day?	

TEAM NUMBER 5-

SCORE / 8

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

2012

2 per team

Inside rectangle ABCD, draw each of the four polygons described below.

Each polygon must meet all of the following *conditions*:

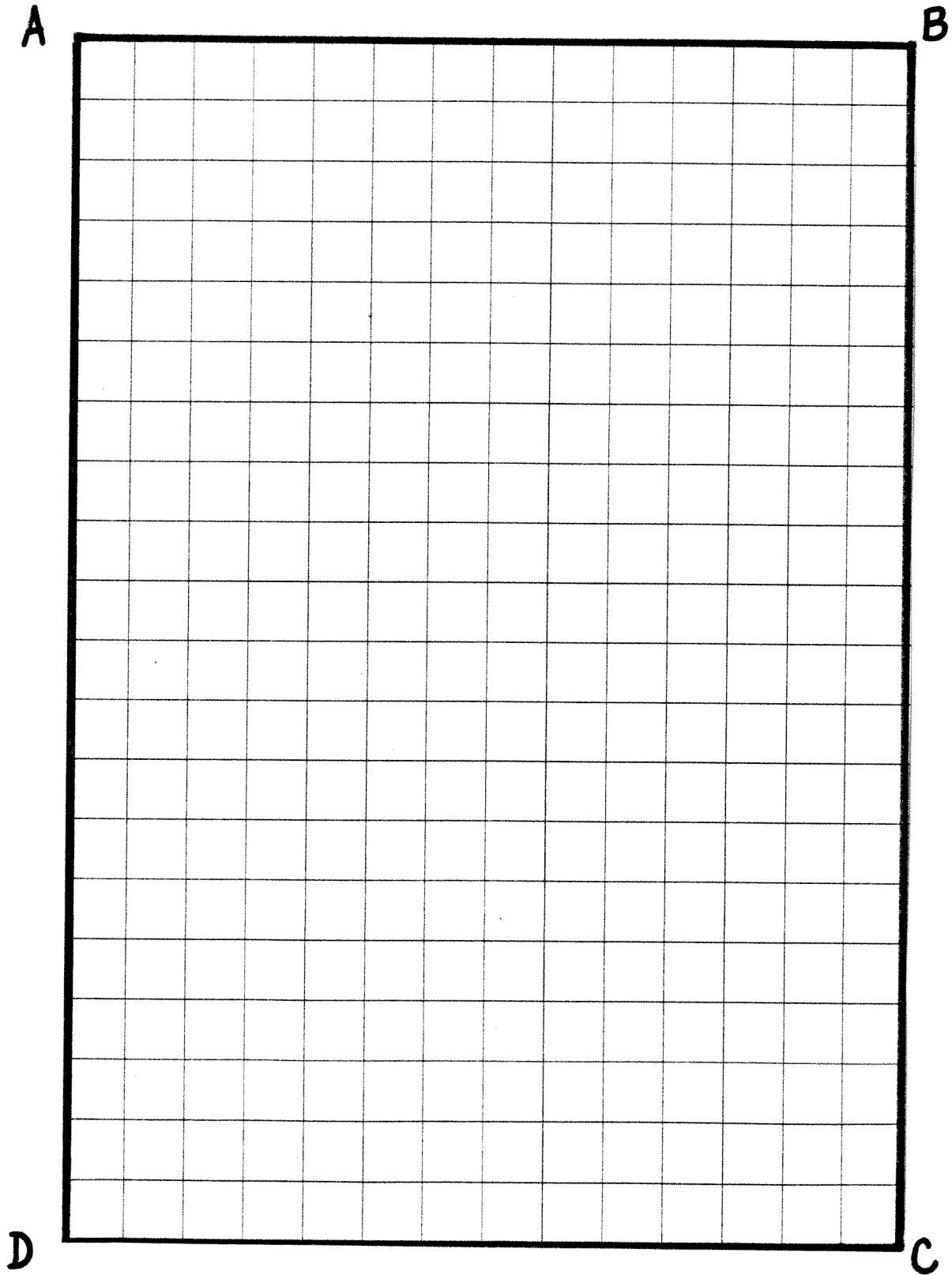
- Two sides of each polygon must lie completely on the sides of rectangle ABCD. (10 pts.)
 - Polygons may share sides or points, but no polygon may overlap another polygon. (10 pts.)
1. Draw one right, isosceles triangle that has an area of 72 square units. (15 pts.)

 2. Draw two distinct rectangles so that each rectangle has an area of 60 square units.
The difference between the perimeters of these rectangles should be 6 units. (30 pts.)

 3. In the remaining area, draw the largest possible square (that meets all of the *conditions*). (15 pts.)

Finally, outline each shape with **bold**, straight segments. Lightly shade the interior of each polygon.

80 points possible

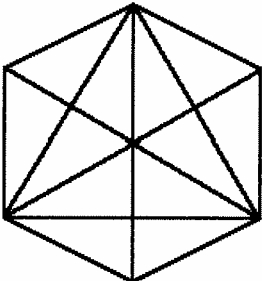
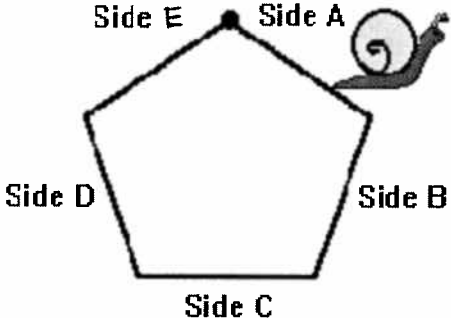


Team

80 pts

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

5th Grade – Pile of 10

1.	<p>10% of the students in a school like the color purple. 180 students don't like the color purple. How many students are in the school?</p>	
2.	<p>A cell doubles every 15 minutes. If there is 1 cell at noon, how many cells will there be at 3p.m.?</p>	
3.	<p>How many digits would it take to write all of the whole numbers from 1 through 300?</p>	
4.	<p>A man must be at work by 9:00 a.m. It takes him 15 minutes to get dressed, 20 minutes to eat, and 35 minutes to walk to work. What is the latest time he should wake up?</p>	
5.	<p>How many triangles are in this figure?</p> <div style="text-align: center;">  </div>	
6.	<p>If Jane is older than Kim. Kim is older than Shawn. Shawn is younger than Jane, and Rachel is older than Jane. List the people from oldest to youngest.</p>	
7.	<p>Shane the Snail started at the dot and crawled clockwise. On which side will he be when he has crawled $\frac{13}{20}$ of the distance around the equilateral pentagon?</p> <div style="text-align: center;">  </div>	

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

8.	<p>An ice cream shop has 16 different flavors of ice cream, 2 different syrups, and 4 different toppings. If a sundae contains 1 scoop of ice cream, 1 syrup, and 1 topping, how many different sundaes can be created?</p>	
9.	<p>A lobster's age in years is approximately his weight multiplied by 4, plus 3 years. Determine the age in years of a 5-pound lobster.</p>	
10.	<p>There are 12 people in a room. 6 people are wearing socks, 4 people are wearing shoes, and 3 people are wearing both. How many people are in bare feet?</p>	

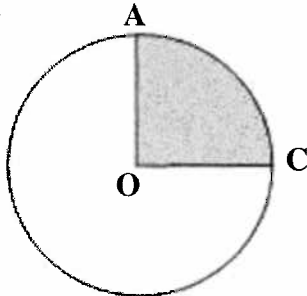
TEAM NUMBER _____

SCORE _____ / 80

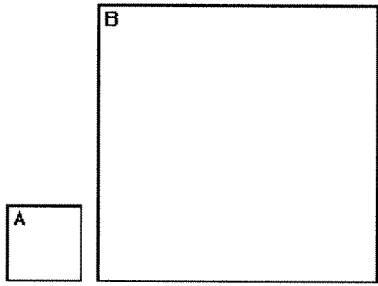
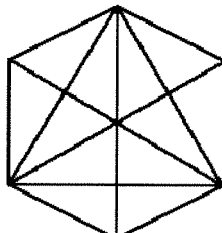
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176

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

6th Grade – Pile of 10

1.	How many digits would it take to write all of the whole numbers from 1 through 300?	
2.	I am a fraction equivalent to $\frac{3}{4}$. When 1 is added to my numerator, I am a fraction equivalent to $\frac{4}{5}$. What fraction am I?	
3.	Find the smallest 4-digit number whose last digit is the sum <i>AND</i> the product of its first three digits.	
4.	The radius of circle O is 7 cm. Angle AOC measures 90 degrees. What is the area of the shaded region to the nearest tenth?	
5.	The greatest common factor of two numbers is 30. Their least common multiple is 420. One of the numbers is 210. What is the other number?	
6.	There are 12 people in a room. 6 people are wearing socks, 4 people are wearing shoes, and 3 people are wearing both. How many people are in bare feet?	

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

7.	One side of square B is four times the length of one side of square A. How many times greater is the area of square B than the area of square A?		
8.	An ice cream shop has 16 different flavors of ice cream, 2 different syrups, and 4 different toppings. If a sundae contains 1 scoop of ice cream, 1 syrup, and 1 topping, how many different sundaes can be created?		
9.	Solve for the value of n. $25 + n = 2n - 25$		
10.	How many triangles are in this figure?		

TEAM NUMBER _____

SCORE _____
80

over
196

5th Grade Problem Solving, Round 1

1.	In a far-off land, three fish can be traded for two loaves of bread, and a loaf of bread can be traded for four bags of rice. How many bags of rice is one fish worth?	<u>2 2/3</u>
2.	A family took a trip to Pittsburgh from Cleveland. Their average speed was 60 mph and the trip took 3 ½ hours. What is the distance between the two cities?	<u>210 miles</u>
3.	Jake won his school's annual (Pi) π Day contest by memorizing and reciting 5,005 digits of the number π . If each digit takes approximately 0.5 second to pronounce, how much time did Jake need to recite all 5,005 digits? Express your answer in minutes rounded to the nearest hundredth.	<u>41.71</u>
4.	Kyle drove from Chicago to New York, which is 630 miles. The first 450 miles were driven at an average speed of 60 mph. Because of engine problems, the remaining distance was driven at an average speed of 45 mph. How long did Kyle's trip take?	<u>11.5 hours</u>

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SCORE _____/40

(20)

6th Grade Problem Solving, Round 1

Answers

1.	If you have two numbers and add the first number to 4 times the second, you would get 30. If the second number is added to 4 times the first, you would get 15. What are the two numbers?	<u>1st = 2</u> <u>2nd = 7</u>
2.	Kyle drove from Chicago to New York, which is 630 miles. The first 450 miles were driven at an average speed of 60 mph. Because of engine problems, the remaining distance was driven at an average speed of 45 mph. How long did Kyle's trip take?	<u>11.5</u> <u>hours</u>
3.	A model of an Egyptian pyramid has a scale of 1.2 inches:38 feet. If the height of the model is 3 inches, what is the height of the real pyramid?	<u>95</u> <u>feet</u>
4.	Marilyn had a bag of gold coins. She gave $\frac{1}{8}$ of them to her mother and then gave $\frac{1}{2}$ of what was left to her brother. She then gave $\frac{2}{7}$ of what was left to her dad. If she then had 25 coins left, how many did she have originally?	<u>80</u>

TEAM NUMBER _____

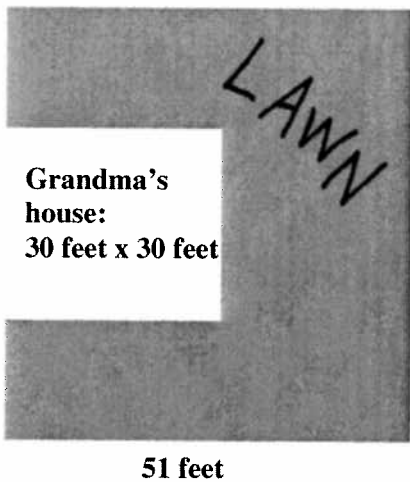
SCORE _____

~~40~~

(21)

5th Grade Problem Solving, Round 2

Answers

1.	<p>It takes Bobby 1 hour and 30 minutes to mow his grandma's lawn, which is shown in the diagram. If Bobby mows at the same rate, how long will it take to mow his uncle's field, which has an area of 3,600 square feet? Express your answer in hours and minutes.</p>	 <p>Grandma's house: 30 feet x 30 feet</p> <p>60 feet</p> <p>51 feet</p>	<p><u>2 hrs</u> <u>30 min</u></p>
2.	<p>A board that is $15 \frac{3}{4}$ feet long is going to be cut into shelves that will be $2 \frac{1}{4}$ feet long. How many shelves will there be?</p>	<p><u>7</u></p>	
3.	<p>There are 140 people who want to cross a river. Boat A holds 18 people. Boat B holds 12 people. Boat C holds 5 people. How many round trips are needed if each boat makes the same number of trips?</p>	<p><u>4</u></p>	
4.	<p>A mother drinks eight 8-ounce glasses of filtered water per day, a father drinks five 8-ounce glasses per day, and their child drinks three 8-ounce glasses per day. If they change their filter every 60 gallons, how many days will each filter last?</p>	<p><u>60</u></p>	

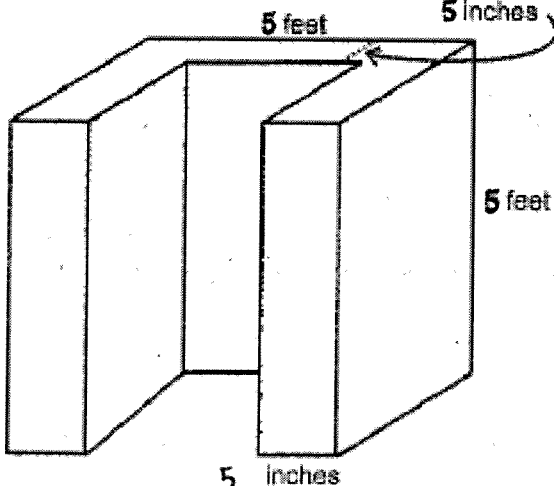
TEAM NUMBER _____

SCORE ~~_____~~ / 40

(22)

6th Grade Problem Solving, Round 2

Answers

1.	A board that is 16 feet long is going to be cut into shelves each measuring exactly $2\frac{1}{4}$ feet long. How many of these shelves will there be?	<u>7</u>
2.	A farmer at a local market sells much of his produce for \$1.50 per pound. A customer first selects eggplant, spinach, and red-leaf lettuce, for a total cost of \$12. This indecisive customer then asks to leave off the lettuce, for a total of \$10.50. Then the customer finally puts the lettuce back in and removes half of the eggplants and pays a total of \$8.25. How many pounds of eggplant did the customer end up taking home?	<u>$2\frac{1}{2}$</u>
3.	Connie has an 18-point average in 16 basketball games. How many points does she need to average in the next 4 games to get her average up to 20 points?	<u>28</u>
4.	<p>Alexandra wants to build a snow fort using packed snow. The fort will be 5 feet tall (with no roof). Each side wall will be 5 inches thick and 5 feet wide. How much snow will Alexandra need to build the fort? Express your answer in cubic inches.</p> 	<u>51,000</u>

TEAM NUMBER _____

SCORE 40

5th & 6th Grade – Mental Math

Before reading aloud, proctor should *fold back answer column*.

Announce that answers only are to be recorded next to each number.

Read aloud clearly. Read each problem twice. Allow ~10 seconds after the second reading.

FOLD BACK

Answers

1.	Candy costs 4 cents per piece. How many pieces can you buy for 60 cents?	1. <u>15</u>
2.	How many fifths are there in 11 and 4 tenths?	2. <u>57</u>
3.	What percent of 120 is 40?	3. <u>33 1/3</u> or <u>33.33...</u>
4.	A triangle has one 25-degree angle, and one 40-degree angle. What is the number of degrees in the third angle?	4. <u>115</u>
5.	A \$24 shirt is on sale for 25% off. What is the new price?	5. <u>\$18</u>
6.	If a quart of milk costs 75 cents what is the cost of 2 gallons of milk?	6. <u>\$6</u>
7.	What is 100 times 9 tenths?	7. <u>90</u>
8.	What is the fifth number in this pattern? 105, 115, 110, 120, _____	8. <u>115</u>
9.	Start with the number 9. Take 1/3 of that. Next multiply by 4. Now add 3. Finally divide by 5. What number is it?	9. <u>3</u>
10.	A triangle, an octagon, and a pentagon have how many sides all together?	10. <u>16</u>

TEAM NUMBER _____

SCORE _____

10

FOLD BACK

(24)

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

5th & 6th Grade – Number Sense

Answers

1.	Bob weighs 100 pounds. If Al weighs 80% more than Bob , and Carl weighs 50% more than Bob , then how much do Al and Carl weigh?	<u>A=180</u> <u>C=150</u>
2.	One pizza and 1 bottle of soda are enough for 6 students. How many pizzas and bottles of soda are needed for a party for 50 students?	<u>9</u> <u>bottles</u> & <u>9</u> <u>pizzas</u>
3.	What is the smallest 4-digit whole number that is divisible by 9?	<u>1008</u>
4.	Write two fractions whose sum is $\frac{7}{10}$ and whose numerators are one.	<u>$\frac{1}{5}$</u> + <u>$\frac{1}{2}$</u>
5.	What is the product of the 5 smallest whole numbers?	<u>0</u>
6.	I am a 2-digit number that is both a square and a cube. Who am I?	<u>64</u>
7.	The sum of my 2 digits is the same as the product of my digits. What number am I?	<u>22</u>
8.	600% of one hour equals what percent of one day?	<u>25</u>

TEAM NUMBER _____

SCORE _____ / 8

(25)

GCCTM Problem Solving Tournament
Team Construction Scoring Rubric

2012

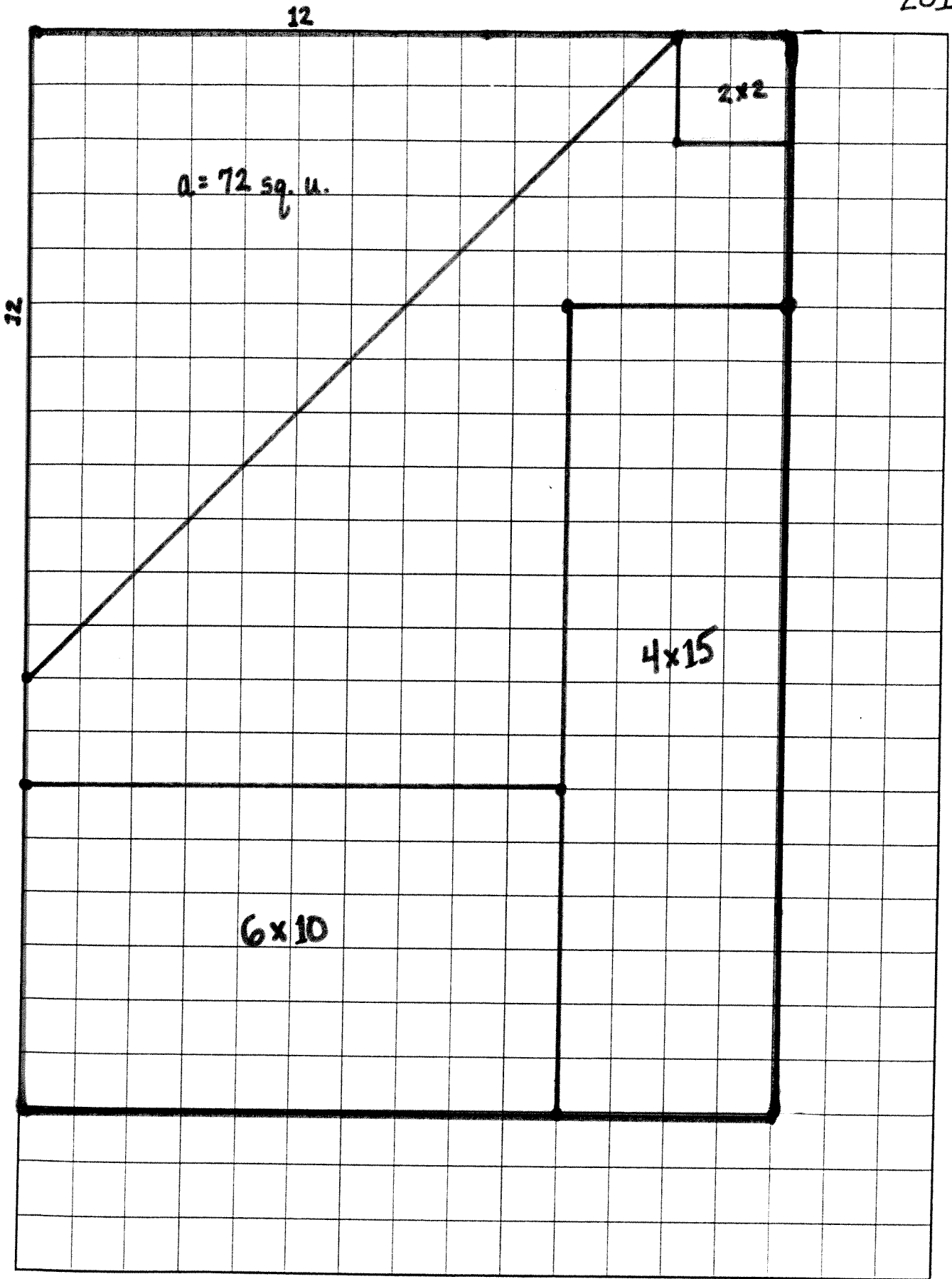
Some of the graders should work privately through the construction in order to gain a fuller appreciation of the task. Extra working marks or folds papers are perfectly acceptable. One scoring suggestion for the Construction Activity is to assign one individual to grade a single requirement, and then pass it to another individual to grade the next requirement, and so on. This helps to provide consistency in scoring. The final product is worth 80 points.

Each of the requirements below must be executed completely and correctly in order to earn the available 8 points. Incorrect or incomplete attempts earn 0 points, *unless the scorers at the site choose to award partial credit on a consistent basis.*

1. One right, isosceles triangle with area = 72 sq. u _____/15
2. One rectangle that measures 6 x 10 _____/15
3. One rectangle that measures 4 x 15 _____/15
4. One square that measures 2 x 2 _____/15
5. Each polygon has 2 whole sides that lie on ABCD _____/10
6. No polygon overlaps another _____/10

Team Number _____

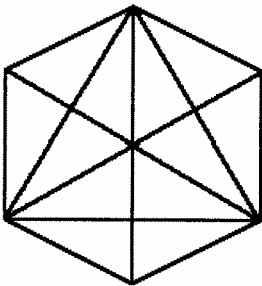
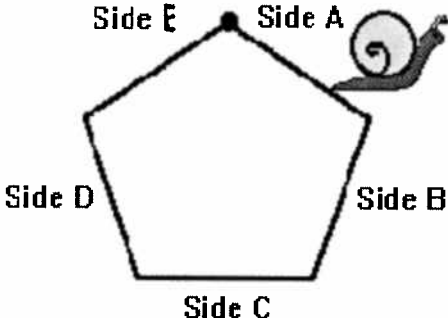
Score _____ / 80



Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

5th Grade – Pile of 10

Answers

1.	10% of the students in a school like the color purple. 180 students don't like the color purple. How many students are in the school?	<u>200</u>
2.	A cell doubles every 15 minutes. If there is 1 cell at noon, how many cells will there be at 3p.m.?	<u>4,096</u>
3.	How many digits would it take to write all of the whole numbers from 1 through 300?	<u>792</u>
4.	A man must be at work by 9:00 a.m. It takes him 15 minutes to get dressed, 20 minutes to eat, and 35 minutes to walk to work. What is the latest time he should wake up?	<u>7:50 am</u>
5.	How many triangles are in this figure? 	<u>31</u>
6.	If Jane is older than Kim. Kim is older than Shawn. Shawn is younger than Jane, and Rachel is older than Jane. List the people from oldest to youngest.	<u>Rachel</u> <u>Jane</u> <u>Kim</u> <u>Shawn</u>
7.	Shane the Snail started at the dot and crawled clockwise. On which side will he be when he has crawled $\frac{13}{20}$ of the distance around the equilateral pentagon? 	<u>D</u>

Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

Answers

8.	An ice-cream shop has 16 different flavors of ice cream, 2 different syrups, and 4 different toppings. If a sundae contains 1 scoop of ice cream, 1 syrup, and 1 topping, how many different sundaes can be created?	<u>128</u>
9.	A lobster's age in years is approximately his weight multiplied by 4, plus 3 years. Determine the age in years of a 5-pound lobster.	<u>23</u>
10.	There are 12 people in a room. 6 people are wearing socks, 4 people are wearing shoes, and 3 people are wearing both. How many people are in bare feet?	<u>5</u>

TEAM NUMBER _____

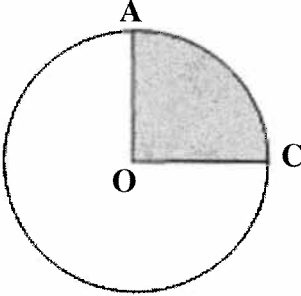
SCORE 80

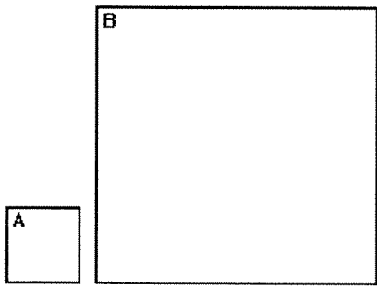
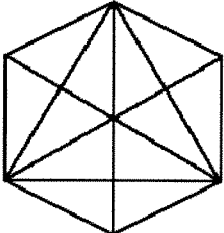
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Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament 2012

6th Grade – Pile of 10

Answers

1.	How many digits would it take to write all of the whole numbers from 1 through 300?	<u>792</u>
2.	I am a fraction equivalent to $\frac{3}{4}$. When 1 is added to my numerator, I am a fraction equivalent to $\frac{4}{5}$. What fraction am I?	<u>$\frac{15}{20}$</u>
3.	Find the smallest 4-digit number whose last digit is the sum <i>AND</i> the product of its first three digits.	<u>1236</u>
4.	The radius of circle O is 7 cm. Angle AOC measures 90 degrees. What is the area of the shaded region to the nearest tenth?	<u>38.5</u> <u>cm²</u>
		
5.	The greatest common factor of two numbers is 30. Their least common multiple is 420. One of the numbers is 210. What is the other number?	<u>60</u>
6.	There are 12 people in a room. 6 people are wearing socks, 4 people are wearing shoes, and 3 people are wearing both. How many people are in bare feet?	<u>5</u>

7.	One side of square B is four times the length of one side of square A. How many times greater is the area of square B than the area of square A?		<u>16</u>
8.	An ice-cream shop has 16 different flavors of ice cream, 2 different syrups, and 4 different toppings. If a sundae contains 1 scoop of ice cream, 1 syrup, and 1 topping, how many different sundaes can be created?	<u>128</u>	
9.	Solve for the value of n. $25 + n = 2n - 25$	<u>n=50</u>	
10.	How many triangles are in this figure?		<u>31</u>

TEAM NUMBER _____

SCORE _____
 80