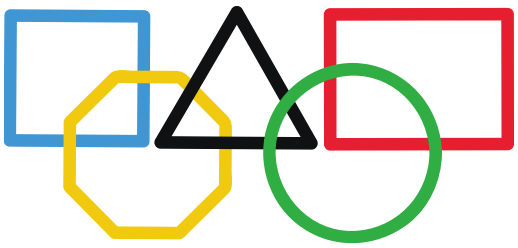


2020
INTERNATIONAL
MATH CONTEST

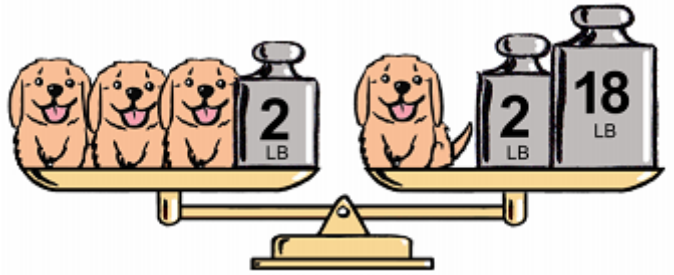
Practice Problems

Grade 3

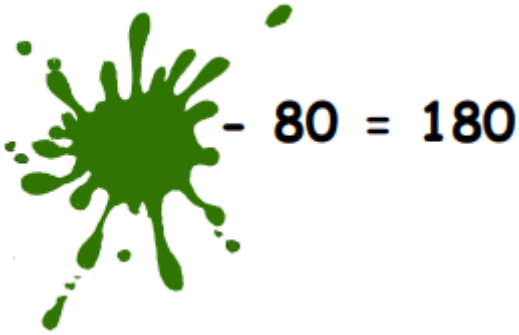
Grade 4

IMC 2019 Grade 3

1. How much does one puppy weigh?



2. What number is covered?

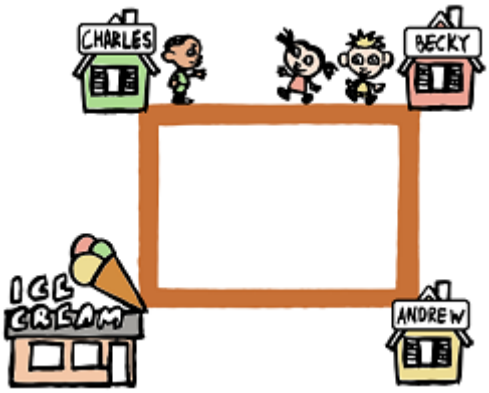


3. John and Mary are building towers out of lego bricks. John used fewer than 18 bricks for his tower. Mary used twice as many bricks as John. What is the greatest number of bricks Mary could have used?

4. Yesterday, Peter the Rabbit picked 84 carrots from his garden and ate one-fourth of them. Today, he ate 12 carrots. How many carrots are left?

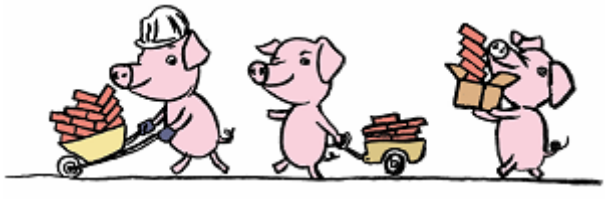
5. What is the smallest possible 3-digit number, whose sum of digits is equal to 10?

6. Andrew walks from his house to Becky's house which is 150 meters away. Then, they walk together to pick up Charles at his house. Lastly, the three friends walk to the ice cream shop. If Andrew walked 650 meters in all, how far is Becky's house from Charles' house?

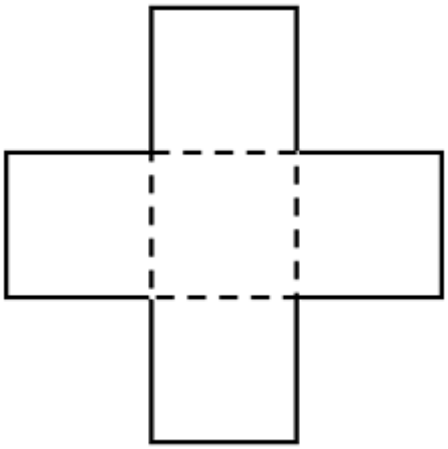


7. A monkey lives on a banana farm, where the trees are 3 meters apart. Sitting on her favorite tree, she eats 8 bananas, then jumps to the next tree. On each new tree, the monkey eats one less banana than she did on the previous tree. She stops to nap on the tree where she ate only one banana. What is the total distance jumped by the monkey?

8. The Three Little Pigs are building a new brick house to hide from the Big Bad Wolf. First, Oinky Pig brought 48 bricks, which is two thirds of the total bricks they needed. Pinky Pig brought half of the rest of the bricks they needed. How many bricks did Squeaky Pig bring?



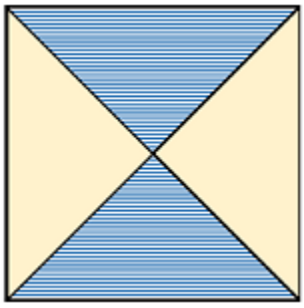
9. The figure is made from five equal squares. If the perimeter of the figure is 72 units, what is the area of one square?



10. Jack's favorite number is 836. Jill subtracts a secret number from 836 and her answer is the smallest possible combination of all the digits from Jack's favorite number. What is the secret number?

11. Alice and Bob were digging for dinosaur eggs. By the end of the day, they found a total of 104 eggs. Alice found 22 more eggs than Bob. How many dinosaur eggs did Alice dig up?

12. A princess wants to tile her bedroom floor with squares. Her bedroom floor is 15 feet long and 10 feet wide. The squares' sides are all 1 ft long. To make each square, she uses 2 striped and 2 solid triangles as shown. She already has all the solid triangles she needs. How many striped triangles should the princess buy?



13. In a school one-third of all 240 students play soccer. Forty four students play both soccer and basketball and sixty students do not play any of these games. How many students play only basketball?

14. An equal number of giants and trolls go on a cruise. On each ship there are either 36 giants or 81 trolls. What is the smallest possible number of ships?

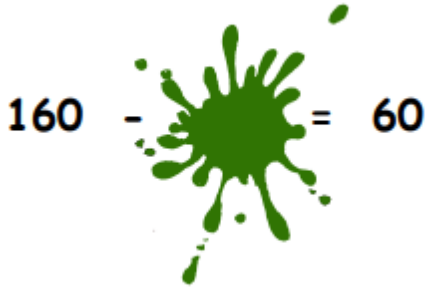
Answers

Question No.	Answer
1	One puppy weighs 9 pounds.
2	The covered number is 260.
3	The greatest possible number of lego bricks that Mary could have used is 34.
4	51 carrots are left.
5	The smallest three-digit number with the sum of its digits equal to 10 is 109.
6	There are 350 meters between Becky's house and Charles' house.
7	The monkey jumped 21 meters.
8	Squeaky Pig brought 12 bricks.
9	The area of one square is 36 square units.
10	The secret number is 468.
11	Alice dug up 63 eggs.
12	The princess should buy 300 striped triangles.
13	100 students play only basketball.
14	The smallest possible number of ships is 13.

Grade 3

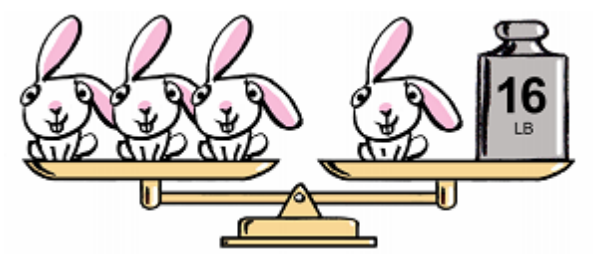
IMC 2018

1. What number is covered?

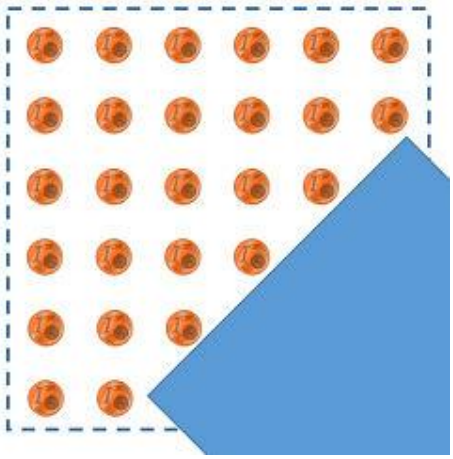


2. How many cuts does Bobby make to split his brother's favorite fishing rod into 3 pieces?

3. How much does one bunny weigh?



4. Coins were arranged in a square. How many coins are covered?

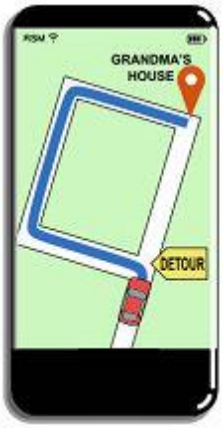


5. What number is the difference between the smallest three digit number and the largest one digit number?

6. On Monday morning, a puppy weighed 11 pounds. The puppy's owner weighs him twice a day. The puppy loses 1 pound by every evening, and gains 3 pounds by every morning. How many pounds will the puppy weigh by Thursday evening of the same week?

7. Three bears cooked 92 pounds of porridge. Baby Bear ate 12 pounds of it, then Mama Bear ate one-fourth of the porridge that was left. Papa Bear finished the rest. How many pounds of porridge did Papa Bear eat?

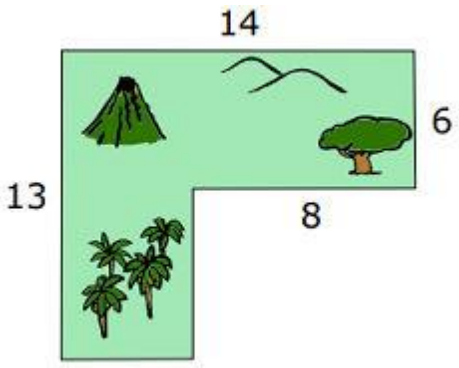
8. Usually Mary drives to grandma's house in a straight line. But today, she saw a "Detour" sign and had to turn left and drive for 4 miles, then take a right and continue, then take another right and drive until she got there. This detour was 24 miles long. How far, in miles, is Mary's usual drive to grandma's house?



9. Winnie-the-Pooh had only one full jar of honey left. The other jars were empty. Trying to find the full jar, Winnie broke one-third of his empty jars. Now, he has 37 jars left (one of them is full of honey). How many jars did he break?

10. A locked box has three digits written on it: 5, 2, and 7. A spy subtracts a Secret Number from the biggest number he can make with those three digits. He gets a difference of 179, which opens the box! What is the Secret Number the spy uses?

11. Find the area of the park.



12. There were 84 more frogs in Green Pond than in Blue Pond. All the frogs from Blue Pond jumped into Green Pond. Now the total number of frogs in Green Pond is 160. How many frogs were there originally in Green Pond?

13. Bailey is making festive cookie bags. She tried to split all her cookies evenly by putting 15 per bag, but the last bag had only 14 cookies. So, she tried putting 10 cookies per bag, but the last bag had only 9. Her mom brought 2 more cookies. Now, Bailey tries 9, then 8, cookies per bag, but she can't do it. Finally, Bailey puts 7 cookies in each bag evenly! What is the least possible total number of cookies?

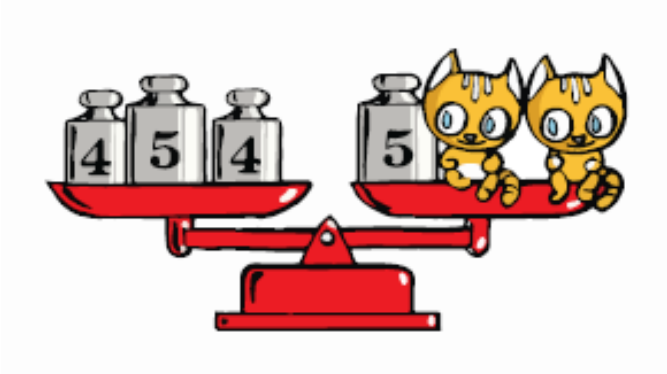
14. There were two competitions in a puzzle tournament. The Sudoku competition had twice as many participants as the Crossword competition. If 170 people competed overall, and 40 of them participated in both competitions, how many people participated in the Sudoku competition?

Answers

Question No.	Answer
1	100
2	2 cuts
3	One bunny weighs 8 lbs.
4	10 coins are covered.
5	The difference is 91.
6	The puppy will weigh 16 pounds by Thursday evening.
7	Papa Bear ate 60 pounds of porridge.
8	Mary's usual drive to grandma's house is 16 miles.
9	Winnie-the-Pooh broke 18 jars.
10	The spy uses the number 573.
11	The area of the park is 126 square units.
12	There were 122 frogs in Green Pond, originally.
13	The least possible total number of cookies is 91.
14	There were 140 participants in the Sudoku competition.

Grade 3: IMC 2017

1. Two kittens and some weights are sitting on the scale. The scale is balanced. How much does one kitten weigh?



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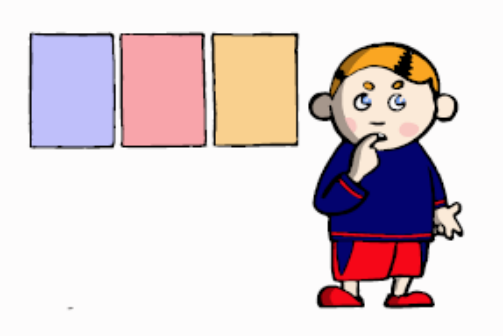
2. What is the greatest possible 3-digit number, whose sum of digits is equal to 13?



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3. There were 30 candies in a box. John ate 5 candies. Julia ate more than 3 but less than 9 candies. What is the greatest possible number of candies that are left in the box?

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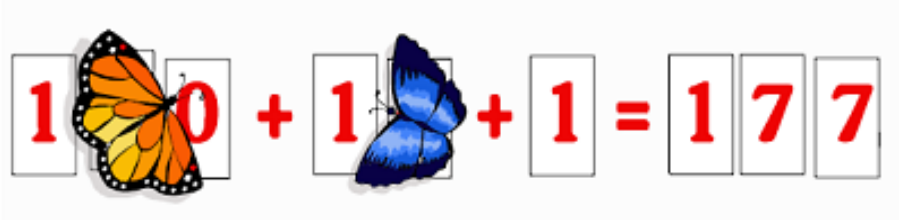
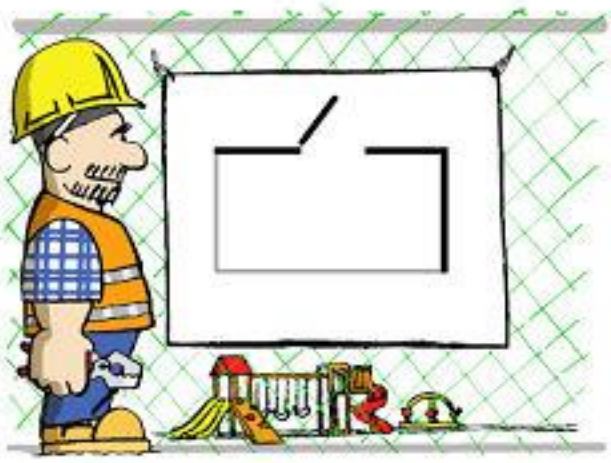
4. Two butterflies covered the same digit. Find this digit.



5. Ben filled one-third of a bottle with 12 ounces of orange juice. How many ounces of orange juice will the bottle contain when it is full?

6. Workers started to build a fence around a playground. They already built 115 feet of the fence and a gate that is 10 feet in length. How many more feet of fence do the workers need to build in order to finish?



7. Anna used some 1 × 2 LEGO bricks to cover an entire 6 × 10 LEGO building plate. How many LEGO bricks did she use?

8. The first letter for Harry arrived at 8 : 05 p.m. and the last letter arrived at 8 : 35 p.m. If one letter arrived each minute, how many letters arrived for Harry?

9. A secret room has the number 458 on its door. When a mystery number is subtracted from this number, the result is the code to open the door. If the code to open the door is 185, what is the mystery number?

10. A young dolphin visited her grandma who lives 54 miles away. On the first day, she swam one-third of the way. On the second day, she swam 12 miles. On the third day, she swam the rest of the way. How many miles did she swim on the third day?

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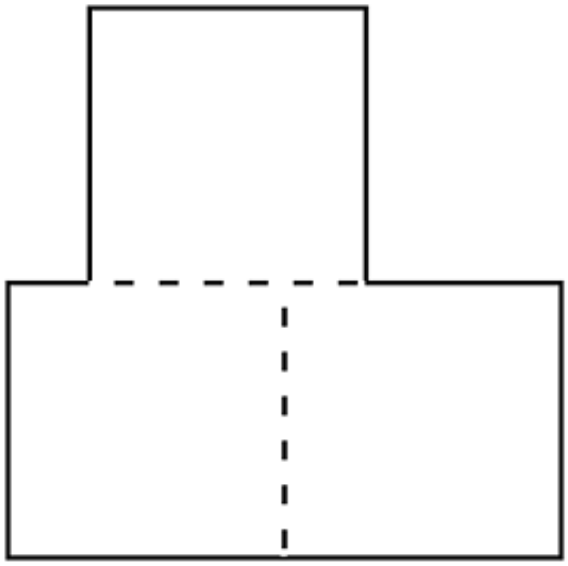
11. The figure is made from three equal squares. If the area of one square is 100 square units, what is the perimeter of the figure?



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12. The teacher wrote two numbers on the board. Eric added the numbers and got 58. Olivia subtracted the second number from the first number and got 28. What is the first number the teacher wrote on the board?

13. In a school, half of the 300 students saw *Zootopia*, 180 students saw *Finding Dory*, and 40 students did not see either movie. How many students saw both movies?

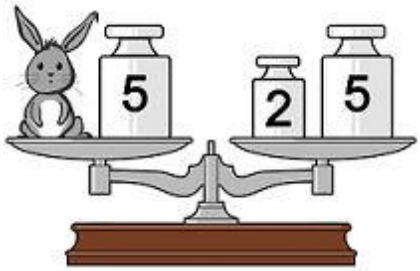
14. Each day, the Royal Chocolate Master puts all of the candies he makes in boxes with the same number of candies in each box. Today the Queen wants him to put 30 candies in each box, but the King wants 25 candies in each box. The Chocolate Master has already made 70 candies. What is the smallest number of candies he still needs to make so that all of the candies can be put into boxes, each with either the Queen's or the King's desired number of candies?

Answers

Question No.	Answer
1	4 pounds
2	940
3	21
4	6
5	36 ounces
6	125 feet
7	30 bricks
8	31 letters
9	273
10	24 miles
11	80 units
12	43
13	70 students
14	80 candies

Grade 3: IMC 2016

1. A bunny and some weights are sitting on the scale. The scale is balanced.



How much does the bunny weigh?

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2. What is the largest possible 3-digit number with all different digits?

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3. Anna had 10 dolls. She gave Lisa more than 5, but not all, of her dolls. What is the largest number of dolls Anna can have now?

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4. Faye spilled juice on her math homework. A number in one of her math problems is covered by the juice. What is that number?

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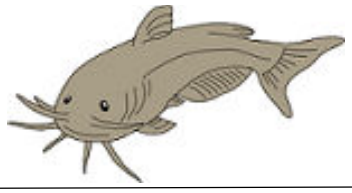
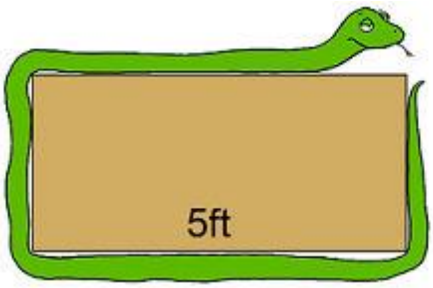
5. Sara has so many fish in her aquarium! There are 15 catfish, which is only one-fourth of all Sara's fish. How many fish are in Sara's aquarium?



6. A lazy snake is 18 ft long. She decided to take a nap wrapped around a rectangular box like this:



The length of the box is 5 ft, what is the width of the box?

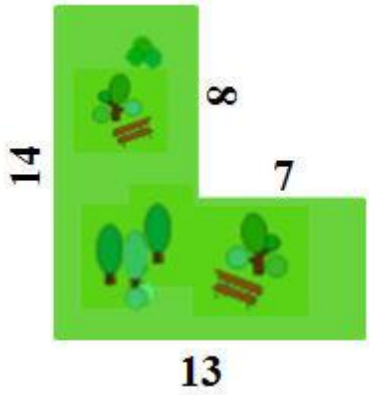
7. How many square tiles with a side whose length is 1 foot are needed to cover the floor of a room that is 20 feet wide and 10 feet long?

8. Ms. Purr has 30 cats. She went to the store and bought toys for 1/3 of them. The rest of the cats are now very upset. How many more toys does she need to buy to make all the cats happy?

9. Mr. Super Spy thought of a secret number. When he subtracted his secret number from 547, the result was 152. What is the secret number?

10. A Number Monster likes to eat whole numbers. Today he was hungry, and ate the numbers 3, 4, 5 and so on. He finished with number 100, which he thought was the yummiest. How many numbers did the Number Monster eat today?

11. Find the area of the park.



12. The sum of two numbers is 40, and the difference between them is 4. What is the larger number?

13. In a school, all 200 fourth-graders play a musical instrument. Some students play the piano, some play the flute, some play both. If 80 students play the piano and 150 students play the flute, how many students play both the piano and the flute?

14. Pirate Pete wants to give each of his pirate friends an equal number of gold coins. But, he can't remember if 3, 4, 5 or 6 of his pirate friends are coming to his party. What is the fewest number of gold coins that Pirate Pete must have so that each pirate friend who comes to his party gets the same number of gold coins?

Answers

Question No.	Answer
1	2 pounds
2	987
3	4 dolls
4	242
5	60 fish
6	4 feet
7	200 tiles
8	20 more toys
9	395
10	98
11	126
12	The larger number is 22
13	30 students play both piano and flute
14	60

IMC 2019 Grade 4

1. A caterpillar crawls one and a half centimeters per second. How far did she crawl in 24 seconds?

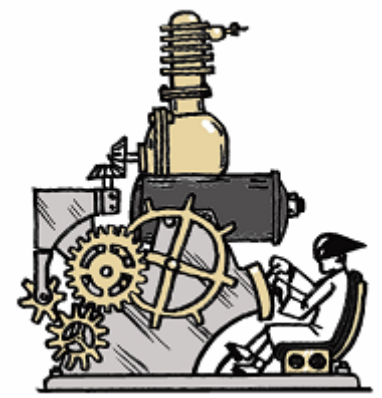
2. What number is covered?

3. Emily has four cards marked 2, 0, 1, and 9. What is the smallest four digit number that Emily can make with her cards?

The smallest four digit number that Emily can make is 1029 or 1026 or 1,029 or 1,026.

4. What is the sum of all of the factors of 25?

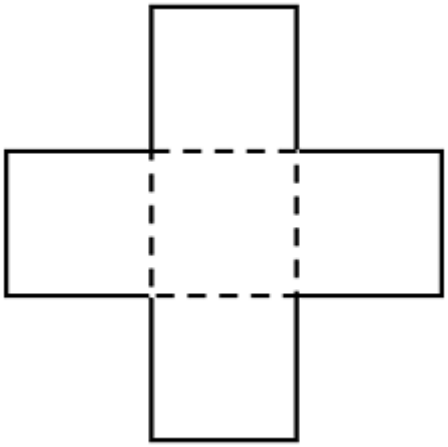
5. At 5 : 15 pm, Wendell Wizard turned on a home-made time machine. The machine malfunctioned, it only made the clock on his machine go twice as fast as a normal clock. When later that day Wendell managed to fix this machine, the clock read 7 : 05 pm. For how many minutes did the clock run at the wrong speed?



6. Peter is making an army of monsters from clay. He can make 2 Mega-Monsters from 7 ounces of clay or 2 Mini-Monsters from 3 ounces of clay. What amount of clay does he need to build an army with 15 Mega-Monsters and 25 mini-Monsters?

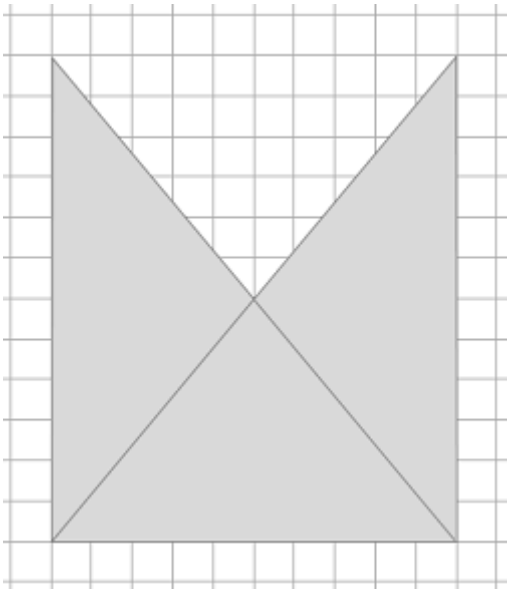
7. Adam the Ant and Anna the Ant dared each other to grab a moving bicycle wheel. Adam the Ant hung on for 20 seconds, in which time the wheel made 30 turns; then, he fell off. Anna the Ant hung on 12 seconds longer than Adam the Ant. How many times did she spin around on the bicycle wheel?

8. The figure is made from five equal squares. If the perimeter of the figure is 72 units, what is the area of one square?

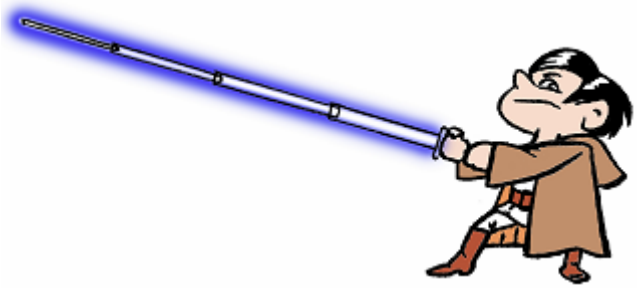


9. Five elves made four identical cakes, each weighing 600 grams. They want to split them up equally, but according to elf tradition, they can each take only three pieces of cake (no matter how big a piece is). After a few minutes, the elves figure out how to split all of the cakes. Each elf gets a half of a cake, a quarter of a cake, and one more piece. How much does the smallest piece of cake weigh?

10. The shaded figure is constructed from triangles. How many square units is the area of the shaded figure?



11. Little Jedi's build-it-yourself-light-saber has 4 sections. The first section is 60 centimeters long, and each following section is 10 centimeters shorter than the previous. When fully extended, each pair of consecutive sections has a 5-centimeter overlap. How long will Jedi's light saber be when fully extended?



12. In a school one-third of all 240 students play soccer. Forty four students play both soccer and basketball and sixty students do not play any of these games. How many students play only basketball?

13. An equal number of giants and trolls go on a cruise. On each ship there are either 36 giants or 81 trolls. What is the smallest possible number of ships?

14. Alice used 9 cm × 9 cm × 9 cm cubes to build a tower which is 12 cubes tall, 4 cubes wide and 3 cubes long. Then, she decided to make her tower taller by taking apart one of the side layers to build a few more layers on the top of the tower. What is the smallest possible height, in centimeters, of the new tower?

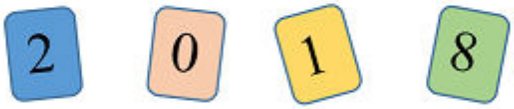
Answers

Question No.	Answer
1	The caterpillar crawled 36 centimeters.
2	The covered number is 9.
3	The smallest four digit number that Emily can make is 1029 or 1026 or 1,029 or 1,026.
4	The sum of all of the factors is 31.
5	The clock ran at the wrong speed for 55 minutes.
6	The least amount of clay Peter needs is 90 ounces.
7	Anna the Ant would have spun around on the wheel 48 times.
8	The area of one square is 36 units.
9	The smallest piece of cake weighs 30 grams.
10	The area of the shaded figure is 90 square units.
11	Fully extended Jedi's light saber is 165 centimeters long.
12	100 students play only basketball.
13	The smallest possible number of ships is 13.
14	The smallest possible height is 144 centimeters.

Grade 4

IMC 2018

1. Rachel has four cards marked 2, 0, 1, and 8. What is the greatest four digit number that Rachel can make with her cards?



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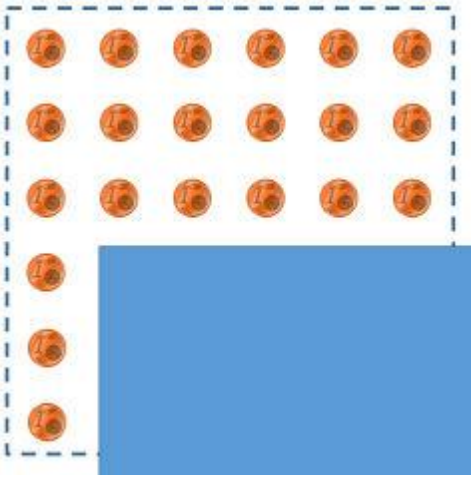
2. Coins were arranged in a square. How many coins are covered?



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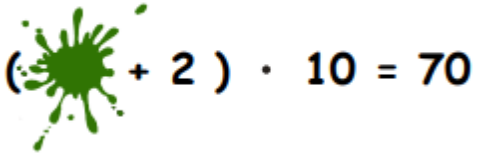
3. What number is covered?



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4. What is the greatest odd factor of 22?

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5. Kangaroo Belle decided to exercise by jumping from her home to the Green River, which is 35 meters away. If she goes two and a half meters in a single jump, how many jumps did she make?

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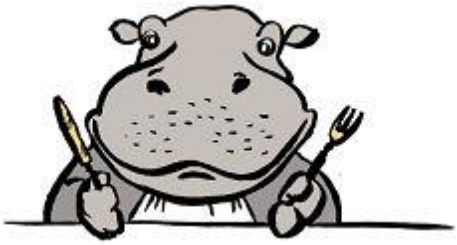
6. A very hungry hippo can eat 25 kilograms of grass in 50 minutes. How many minutes will it take the hippo to eat 60 kilograms of grass?



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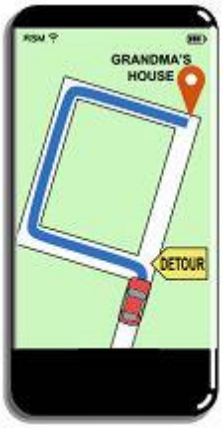
7. Usually Mary drives to grandma's house in a straight line. But today, she saw a "Detour" sign and had to turn left and drive for 8 miles, then take a right and continue, then take another right and drive until she got there. This detour was 38 miles long. How far, in miles, is Mary's usual drive to grandma's house?



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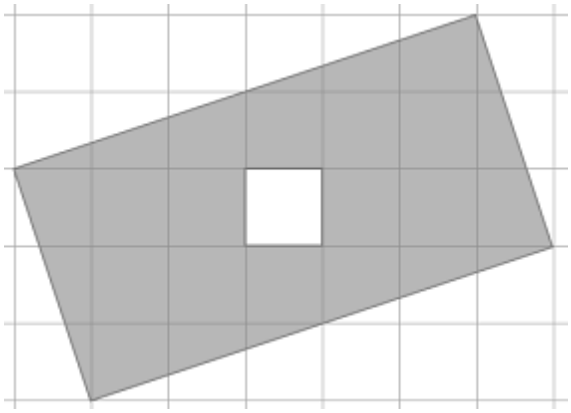
8. Winnie-the-Pooh had only one full jar of honey left. The other jars were empty. Trying to find the full jar, Winnie broke one-third of his empty jars. Now, he has 37 jars left (one of them is full of honey). How many jars did he break?

9. Two days ago, Princess Genevieve gave the village Dragon two chocolate bars, and she flew on his back for fifteen minutes. Yesterday, she gave the Dragon two cookies, and she flew on his back for nine minutes. Today the Princess gave him 5 chocolate bars and 1 cookie. For how many minutes did she fly on his back?

10. If the area of the white square in the middle is 4 square units, find the area of the shaded region.



11. Aladdin found a cave with boxes of treasure inside, each measuring 2 inches × 2 inches × 2 inches. However, Aladdin brought only one box, measuring 6 inches ×

8 inches × 10 inches, with him. He fills it with as many boxes of treasure as would fit. How many boxes of treasure was he able to take?

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12. Ann wants to organize her sculptures on some of the shelves in her room. If she puts 15 sculptures per shelf, one shelf has only 14 sculptures on it. If she puts 12 sculptures per shelf, one shelf has only 11 sculptures on it. What is the least number of sculptures that Ann could have?

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13. There were two competitions in a puzzle tournament. The Sudoku competition had twice as many participants as the Crossword competition. If 225 people competed overall, and 60 of them participated in both competitions, how many people participated in the Sudoku competition?

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14. A cabinet has two sliding doors of different sizes. When the cabinet is fully closed, they overlap by two-fifths of the width of the smaller door. When both doors are slid to one side, the part of the longer door that is not behind the shorter one is

half as wide as the original overlap, and the open portion of the cabinet is 36 inches wide. What is the width of the whole cabinet?

Answers

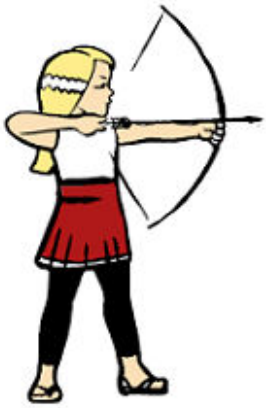
Question No.	Answer
1	The greatest four digit number that Rachel can make is 8210
2	15 coins are covered.
3	The covered number is 5.
4	The greatest odd factor is 11.
5	Kangaroo Belle made 14 jumps.
6	It will take 120 minutes.
7	Mary's usual drive to grandma's house is 22 miles.
8	Winnie-the-Pooh broke 18 jars.
9	Princess Genevieve flew for 42 minutes.
10	The area of the shaded region is 76 square units.
11	Aladdin was able to take 60 boxes of treasure.
12	The least number of sculptures Ann could have is 59.

13	There were 190 participants in the Sudoku competition.
14	The width of the whole cabinet is 108 inches.

Grade 4

IMC 2017

1. Ella shot twelve arrows at a target. After each shot, she wrote the current sum of her points on a piece of paper: 3, 5, 8, 11, 14, 16, 18, 24, 27, 29, 30. All of the sums she wrote are correct, but she forgot to write one of the sums down. What sum did she forget to write?



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2. A snail started to climb up a pole at 10 a.m. She climbed 3 inches every half hour. At 4 p.m. she stopped to take a break. How many inches up the pole had she climbed?

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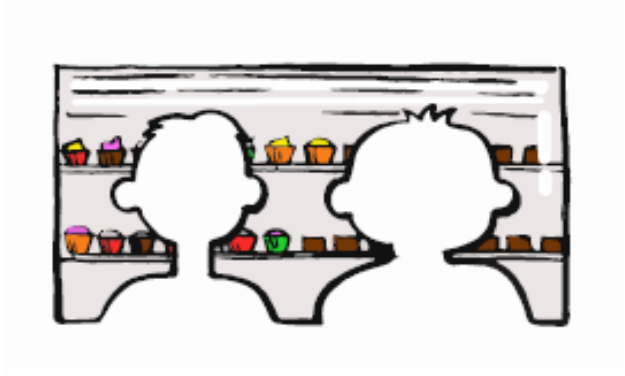
3. John paid $22.50 for 9 cupcakes. Peter planned to spend all of his money to buy 20 brownies that cost $1.75 each. Instead, however, he bought the same cupcakes John bought. If Peter spent all of his money, how many cupcakes did he buy?



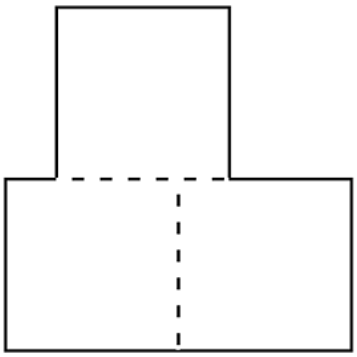
4. A clock is half an hour slow. If the clock showed the time as 3 : 40 p.m. half an hour ago, how many minutes before 5 : 00 p.m. is it now?

5. Tim forgot his secret number, but he knows that it is 5 more than the number hidden by "*" in the correct number sentence:

$$5 \cdot (* + 1) = 40$$

What is Tim's secret number?

6. The figure is made from three equal squares. If the area of one square is 100 square units, what is the perimeter of the figure?

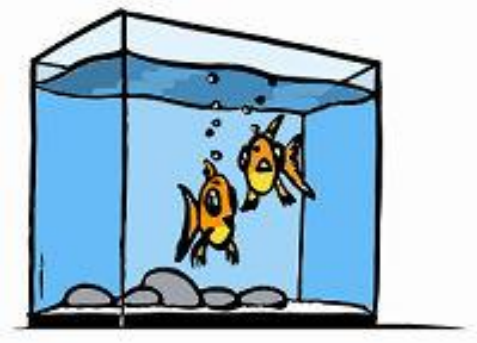


7. What is the sum of all the factors of 91?

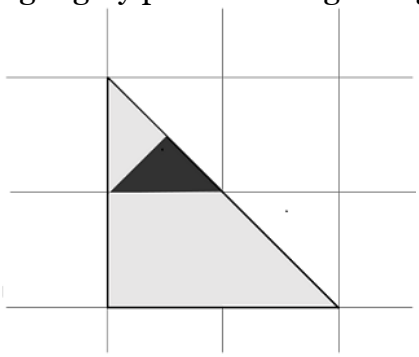
8. Each day, the Royal Chocolate Master puts all of the candies he makes in boxes with the same number of candies in each box. Today the Queen wants him to put 30 candies in each box, but the King wants 25 candies in each box. The Chocolate Master has already made 70 candies. What is the smallest number of candies he still needs to make so that all of the candies can be put into boxes, each with either the Queen's or the King's desired number of candies?

9. In a cookie-eating contest, Luke ate 8 cookies in 1 minute and 30 seconds. At this rate, how many cookies will he eat in 3 minutes and 45 seconds?

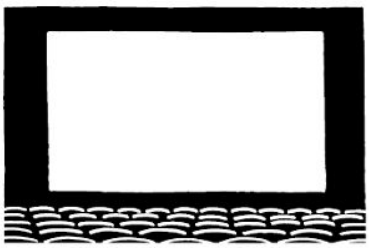
10. Sara has a fish tank that is 10 inches long, 6 inches wide, and 9 inches high. She poured water into the fish tank. If the surface of the water is 2 inches from the top of the tank, how many cubic inches of water did she pour into the fish tank?



11. If the area of the small dark gray triangle is 6 square units, how many square units is the area of the light gray part of the big triangle?



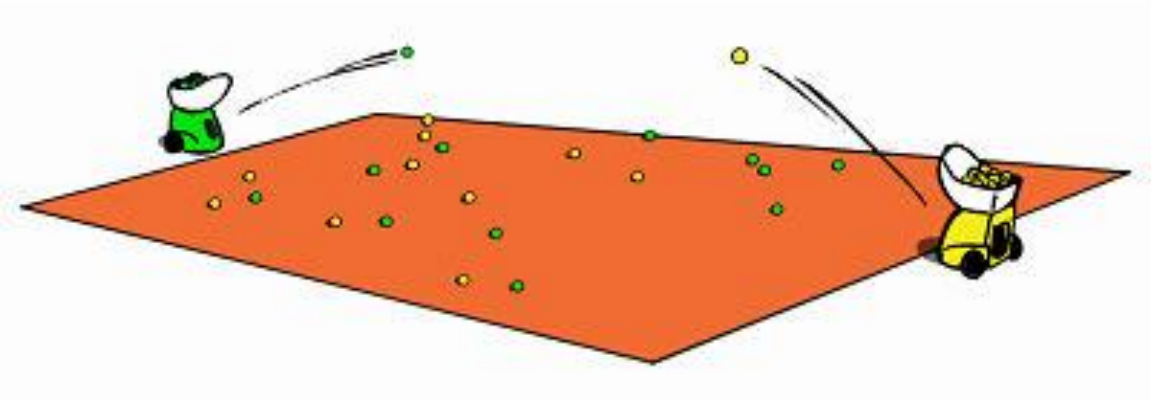
12. In a school, half of the 300 students saw *Zootopia*, 180 students saw *Finding Dory*, and 45 students did not see either movie. How many students saw both movies?



13. In a juggling competition, $\frac{7}{20}$ of all the jugglers use balls only, $\frac{3}{7}$ of all the jugglers use rings only, and the rest of jugglers use both balls and rings. If there are less

than 200 jugglers in the competition, how many jugglers use both balls and rings?

14. Two faulty tennis ball machines start to shoot balls from opposite sides of a 25 meter by 10 meter tennis court. The green ball machine shoots green balls that stop on the court 5 meters to 20 meters from the green machine's side. The yellow ball machine shoots yellow balls that stop on the court 2 meters to 16 meters from the yellow machine's side. Find the area of the tennis court that has balls of either color on it.



Answers

Question No.	Answer
1	21
2	36 inches
3	14 cupcakes
4	It is 20 minutes before 5 : 00 p.m.

5	12
6	80 units
7	112
8	80 candies
9	20 cookies
10	420 cubic inches
11	42 square units
12	75 students
13	31
14	110 square meters

Grade 4

IMC 2016

1. Sammy came home from school half an hour ago. His parents always come home one hour after Sammy comes home. In how many minutes will Sammy's parents come home?

_____

2. Michael wrote on the board a number sentence where he added several numbers.
   This is how he started it: 1 + 1 + 1+
   This is how he finished it: +1 + 1 = 11
   In the middle, he wrote as many pluses and ones as needed to make the number sentence correct.
   How many symbols altogether (digits as well as "+" and "=") did Michael write?

_____

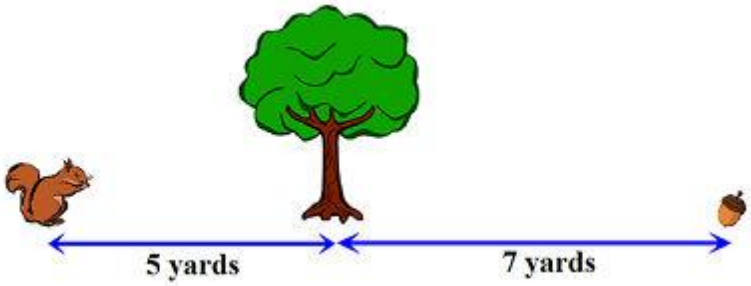
3. If you pay $2.50 for two chocolate bars and 3 dollars for four cookies, how many dollars would you pay for a chocolate bar and a cookie?

_____

4. A rectangular playground is 12 yards wide and twice as long. How long is the fence around it? The gates are part of the fence.

_____

5. The squirrel's jumps are one half of a yard long. How many jumps must the squirrel make to get to the acorn?



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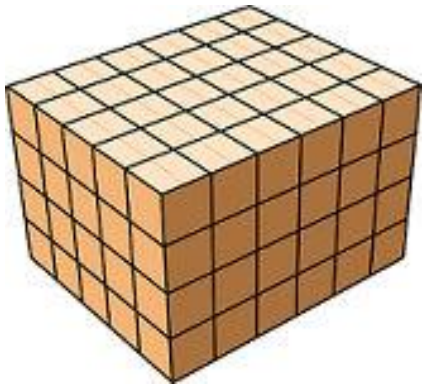
6. Pirate Pete wants to give each of his pirate friends an equal number of gold coins. But, he can't remember if 3, 4, 5 or 6 of his pirate friends are coming to his party. What is the fewest number of gold coins that Pirate Pete must have so that each pirate friend who comes to his party gets the same number of gold coins?

7. What number does x stand for in the correct number sentence below?

$$3 \cdot (x - 1) = 12$$

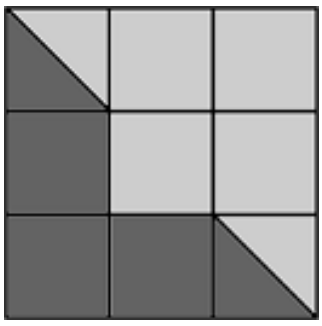
8. What is the sum of all the factors of 22?

9. Leah stored all of her RSM homework papers for the last 3 years in boxes. She stacked the boxes in a pile 5 boxes wide, 6 boxes long, and 4 boxes high. How many boxes of homework papers does Leah have?



10. It takes a turtle 2 hours to walk 6 miles. In how many minutes would it walk 2 miles?

11. If the light gray area is 10 units, how many units is the dark gray area?



12. In a school, all 200 fourth-graders play a musical instrument. Some students play the piano, some play the flute, and some play both. If 80 students play the piano and 150 students play the flute, how many students play both the piano and the flute?

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13. A young wizard knows every third spell that an old wizard knows. However, the young wizard knows two spells that the old wizard does not know. 8/9 of all the spells that the young wizard knows are known to the old wizard as well. How many spells are there that at least one of them knows?

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14. A Magic Carpet is 12 feet long and 10 feet wide. However, only the purple part of the Magic Carpet has magic power. If the magic part is 2 feet wide, find the area of the magic part of the Magic Carpet.

Answers

Question No.	Answer
1	30 minutes
2	24 symbols

3	$2
4	72 yards
5	24 jumps
6	60
7	5
8	36
9	120 boxes
10	40 minutes
11	8 units
12	30 students play piano and flute
13	50 spells
14	72 square feet