2003 AMC 8

Time limit: 40 minutes

Typeset by: LIVE by Po-Shen Loh
https://live.poshenloh.com/past-contests/amc8/2003

Copyright: Mathematical Association of America. Reproduced with permission.

1. Jamie counted the number of edges of a cube, Jimmy counted the numbers of corners, and Judy counted the number of faces. They then added the three numbers. What was the resulting sum?

A 12

B 16

C 20

D 22

E 26

2. Which of the following numbers has the smallest prime factor?

A 55

B 57

C 58

D 59

E 61

3. A burger at Ricky C's weighs 120 grams, of which 30 grams are filler. What percent of the burger is not filler?

A 60%

B 65%

C 70%

D 75%

E 90%

4. A group of children riding on bicycles and tricycles rode past Billy Bob's house. Billy Bob counted 7 children and 19 wheels. How many tricycles were there?

A 2

B 4

C 5

D 6

E 7

5. If 20% of a number is 12, what is 30% of the same number?

A 15

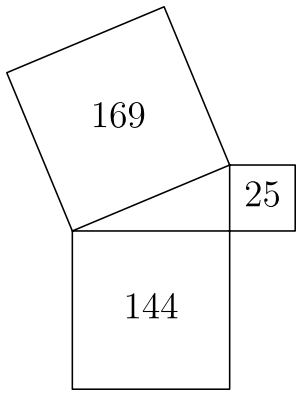
B 18

C 20

D 24

E 30

6. Given the areas of the three squares in the figure, what is the area of the interior triangle?



A 13

B 30

C 60

D 300

E 1800

7. Blake and Jenny each took four 100-point tests. Blake averaged 78 on the four tests. Jenny scored 10 points higher than Blake on the first test, 10 points lower than him on the second test, and 20 points higher on both the third and fourth tests. What is the difference between Jenny's average and Blake's average on these four tests?

A 10

B 15

C 20

D 25

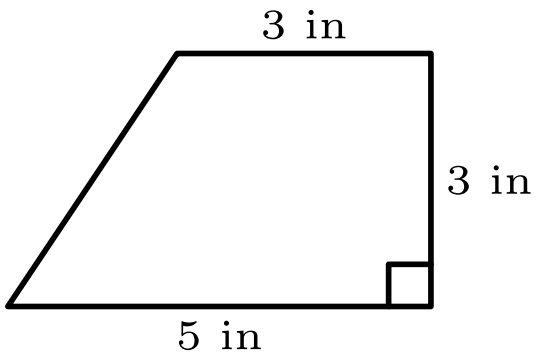
E 40

8. Problems $8, 9,$ and 10 use the data found in the accompanying paragraph and figures.

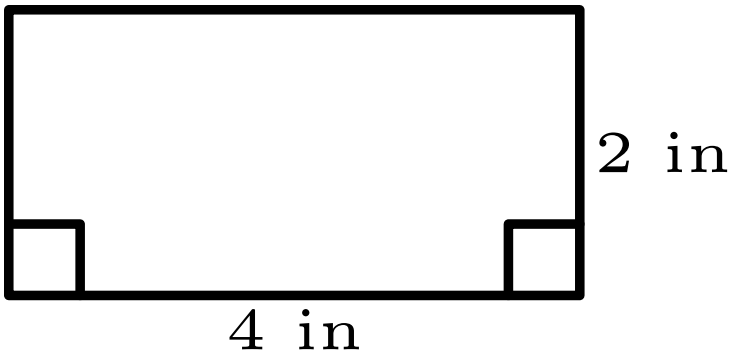
Bake Sale

Four friends, Art, Roger, Paul and Trisha, bake cookies, and all cookies have the same thickness. The shapes of the cookies differ, as shown.

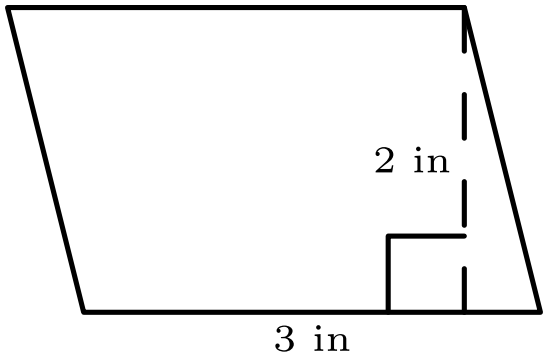
- Art's cookies are trapezoids:



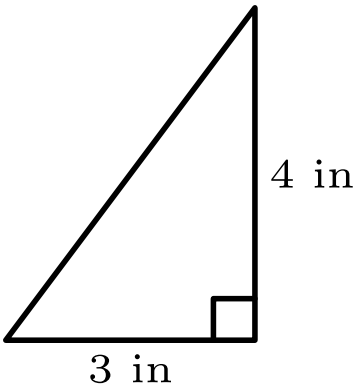
- Roger's cookies are rectangles:



- Paul's cookies are parallelograms:



- Trisha's cookies are triangles:



Each friend uses the same amount of dough, and Art makes exactly 12 cookies.

Who gets the fewest cookies from one batch of cookie dough?

A Art

B Paul

C Roger

D Trisha

E There is a tie for fewest.

9. Art's cookies sell for $60¢$ each. To earn the same amount from a single batch, how much should one of Roger's cookies cost?

A $18¢$

B $25¢$

C $40¢$

D $75¢$

E $90¢$

10. How many cookies will be in one batch of Trisha's cookies?

A 10

B 12

C 16

D 18

E 24

11. Business is a little slow at Lou's Fine Shoes, so Lou decides to have a sale. On Friday, Lou increases all of Thursday's prices by 10%. Over the weekend, Lou advertises the sale: "Ten percent off the listed price. Sale starts Monday." How much does a pair of shoes cost on Monday that cost $\$40$ on Thursday?

A $\$36$

B $\$39.60$

C $\$40$

D $\$40.40$

E $\$44$

12. When a fair six-sided die is tossed on a table top, the bottom face cannot be seen. What is the probability that the product of the numbers on the five faces that can be seen is divisible by 6?

A $\frac{1}{3}$

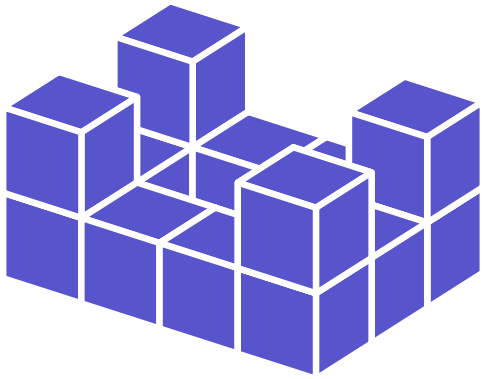
B $\frac{1}{2}$

C $\frac{2}{3}$

D $\frac{5}{6}$

E 1

13. Fourteen white cubes are put together to form the figure on the right. The complete surface of the figure, including the bottom, is painted. The figure is then separated into individual cubes. How many of the individual cubes have exactly four painted faces?



A 4

B 6

C 8

D 10

E 12

14. In this addition problem, each letter stands for a different digit.

$$\begin{array}{cccc} & T & W & O \\ + & T & W & O \\ \hline F & O & U & R \end{array}$$

If $T = 7$ and the letter O represents an even number, what is the only possible value for W?

A 0

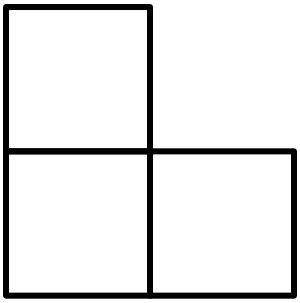
B 1

C 2

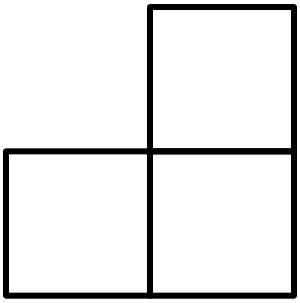
D 3

E 4

15. A figure is constructed from unit cubes. Each cube shares at least one face with another cube. What is the minimum number of cubes needed to build a figure with the front and side views shown?



Front



Side

A 3

B 4

C 5

D 6

E 7

16. Ali, Bonnie, Carlo and Dianna are going to drive together to a nearby theme park. The car they are using has four seats: one driver's seat, one front passenger seat and two back seats. Bonnie and Carlo are the only two who can drive the car. How many possible seating arrangements are there?

A 2

B 4

C 6

D 12

E 24

17. The six children listed below are from two families of three siblings each. Each child has blue or brown eyes and black or blond hair. Children from the same family have at least one of these characteristics in common. Which two children are Jim's siblings?

Child	Eye Color	Hair Color
Benjamin	Blue	Black
Jim	Brown	Blond
Nadeen	Brown	Black
Austin	Blue	Blond
Tevyn	Blue	Black
Sue	Blue	Blond

A Nadeen and Austin

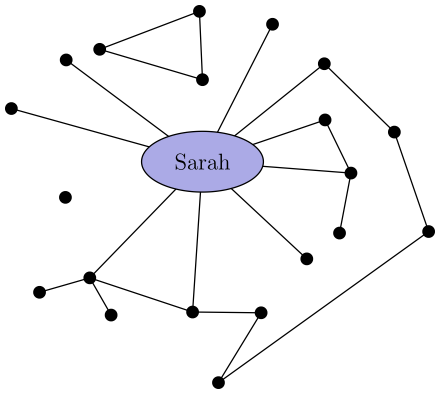
B Benjamin and Sue

C Benjamin and Austin

D Nadeen and Tevyn

E Austin and Sue

18. Each of the twenty dots on the graph below represents one of Sarah's classmates. Classmates who are friends are connected with a line segment. For her birthday party, Sarah is inviting only the following: all of her friends and all of those classmates who are friends with at least one of her friends. How many classmates will not be invited to Sarah's party?



A 1

B 4

C 5

D 6

E 7

19. How many integers between 1000 and 2000 have all three of the numbers $15, 20,$ and 25 as factors?

A 1

B 2

C 3

D 4

E 5

20. What is the measure of the acute angle formed by the hands of a clock at $4:20$ a.m.?

A 0°

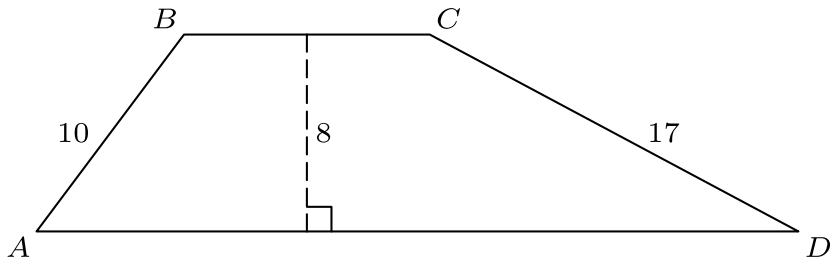
B 5°

C 8°

D 10°

E 12°

21. The area of trapezoid $ABCD$ is $164\ \text{cm}^2$. The altitude is 8 cm, AB is 10 cm, and CD is 17 cm. What is BC, in centimeters?



A 9

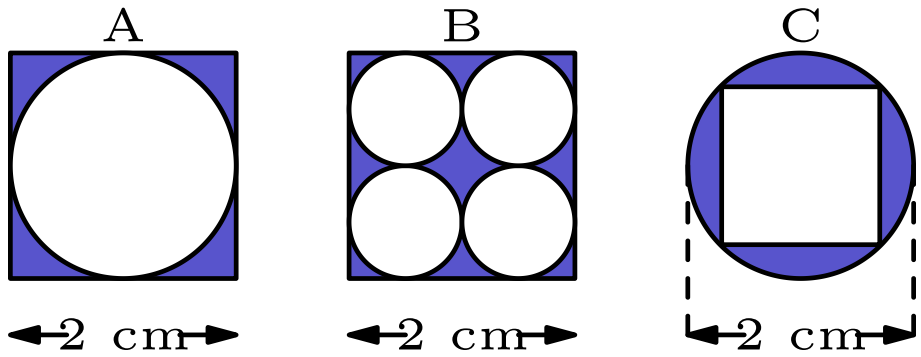
B 10

C 12

D 15

E 20

22. The following figures are composed of squares and circles. Which figure has a shaded region with largest area?



A A only

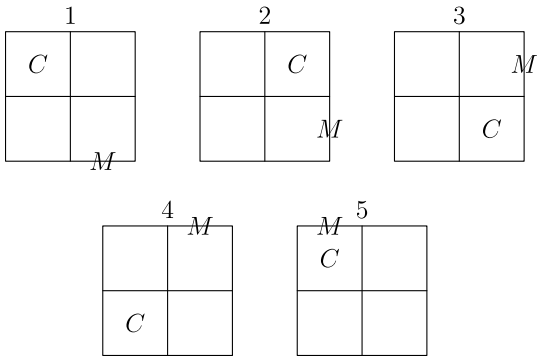
B B only

C C only

D both A and B

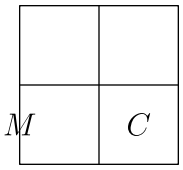
E all are equal

23. In the pattern below, the cat moves clockwise through the four squares and the mouse moves counterclockwise through the eight exterior segments of the four squares.

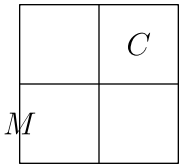


If the pattern is continued, where would the cat and mouse be after the 247th move?

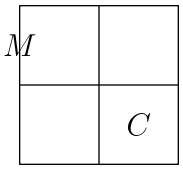
A



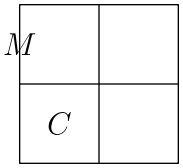
B



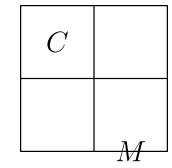
C



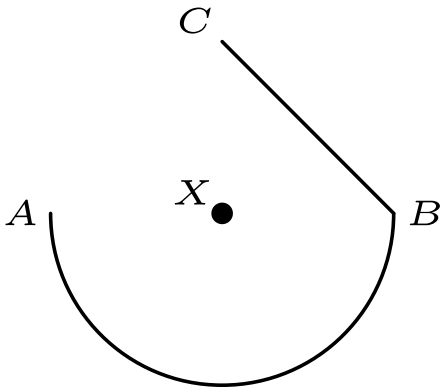
D



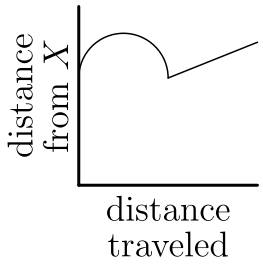
E



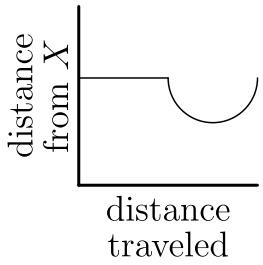
24. A ship travels from point A to point B along a semicircular path, centered at Island X. Then it travels along a straight path from B to C. Which of these graphs best shows the ship's distance from Island X as it moves along its course?



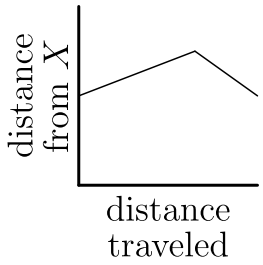
A



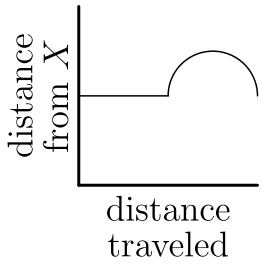
B



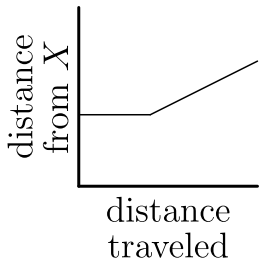
C



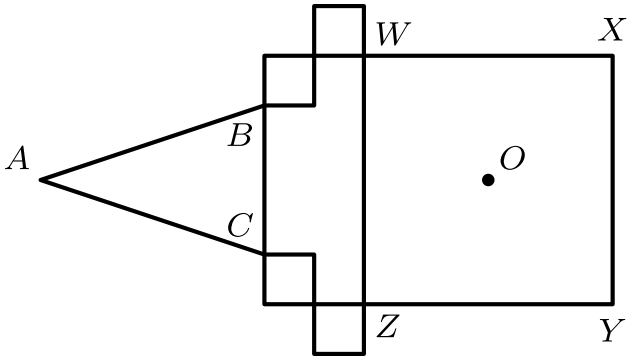
D



E



25. In the figure, the area of square $WXYZ$ is $25\ \text{cm}^2$. The four smaller squares have sides 1 cm long, either parallel to or coinciding with the sides of the large square. In $\triangle ABC$, $AB = AC$, and when $\triangle ABC$ is folded over side $\overline{BC}$, point A coincides with O, the center of square $WXYZ$. What is the area of $\triangle ABC$, in square centimeters?



A $\frac{15}{4}$

B $\frac{21}{4}$

C $\frac{27}{4}$

D $\frac{21}{2}$

E $\frac{27}{2}$

Solutions: https://live.poshenloh.com/past-contests/amc8/2003/solutions

