14th Annual

# Mathletes Challenge

2019

CHAMPIONSHIP ROUND
Test 2

1 Serena bought 5 shirts for $6 each and spent $7 on lunch. She paid for the shirts and lunch using her debit card. The change in the balance of Serena's checking account can be represented by the expression shown.

$$5(-6) + (-7)$$

Which integer represents the change in the balance of Serena's checking account from these purchases?

A −37

B 23

C −18

D 4

2 The face of a lamp shade is shaped like a trapezoid. The dimensions of the face are shown in the diagram.

6 in.

y in. x in. y in.

10 in.
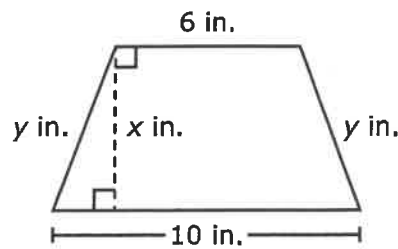
Which equation can be used to find A, the area of the face of the lamp shade in square inches?

A $A = \frac{1}{2}(6 + 10)y$

B $A = \frac{1}{2}(6 + 10)x$

C $A = \frac{1}{2}(6) + (10)x$

D $A = \frac{1}{2}(6) + (10)y$

---

3 George wrote an integer. The opposite of George's integer is -53.

Which of these statements about George's integer must be true?

    I.   The integer is 53.
    II. The integer has an absolute value of -53.
    III. The integer is -53.
    IV. The integer has an absolute value of 53.

A I and II

B II and IV

C II and III

D I and IV

4 The dot plot shows the lengths of the 12 trailers sold at a store last month.

Trailers Sold

Length (feet)
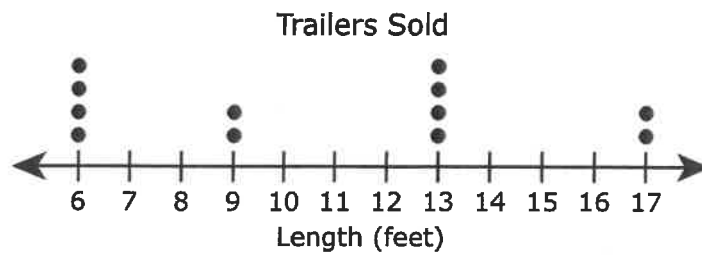
Which statement about the data is true?

A ⬤ The interquartile range is 7, and the range is 17.

B ⬤ The interquartile range is 7, and the range is 11.

C ⬤ The interquartile range is 2.75, and the range is 17.

D ⬤ The interquartile range is 2.75, and the range is 11.

5 A carpenter charges $720 for 18 hours of work. She charges the same amount of money for each hour of work.

Which table shows the relationship between the amount of time the carpenter works and the amount of money she charges?

A   Carpenter's Charges

Amount of Time Worked (hours)	Amount Charged (dollars)
2	80
4	160
6	240
8	320

C   Carpenter's Charges

Amount of Time Worked (hours)	Amount Charged (dollars)
3	75
5	125
7	175
9	225

B   Carpenter's Charges

Amount of Time Worked (hours)	Amount Charged (dollars)
19	720
20	738
21	756
22	774

D   Carpenter's Charges

Amount of Time Worked (hours)	Amount Charged (dollars)
14	720
15	720
16	720
17	720

6 An engine is operating at 25% of its full power. Which number line shows a point that represents 25%?

A

B

C

D

---
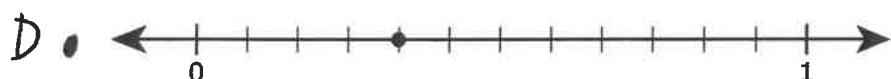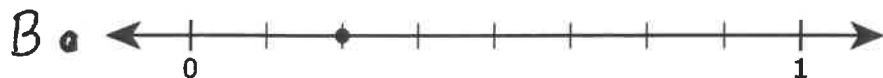
7 A can contains 24 fluid ounces of fruit juice. How many pints of fruit juice does the can contain?

A 12 pt

B 3 pt

C $1\frac{1}{2}$ pt

D $\frac{1}{3}$ pt

---

8 Shea wrote the expression $5(y + 2) + 4$ to show the amount of money five friends paid for snacks at a baseball game. Which expression is equivalent to the one Shea wrote?

A $5 + y + 5 + 2 + 4$

B $5 \cdot y \cdot 5 \cdot 2 + 4$

C $5 \cdot y \cdot 4 + 5 \cdot 2 \cdot 4$

D $5 \cdot y + 5 \cdot 2 + 4$

9 The table shows the approximate median annual salaries associated with two levels of education.

Median Annual Salaries

Level of Education	Bachelor's degree	Master's degree
Median Annual Salary (dollars)	57,600	69,100

Based on the data in the table, how much more money would a person with a master's degree earn than a person with a bachelor's degree over a 35-year career?

A $402,500

B $126,770

C $11,500

D $4,434,500

10. Employees who have retired from a company are placed in different benefit categories. The bar graph shows the percentages of the retired employees in different benefit categories.

Retired Employees

Benefits Category
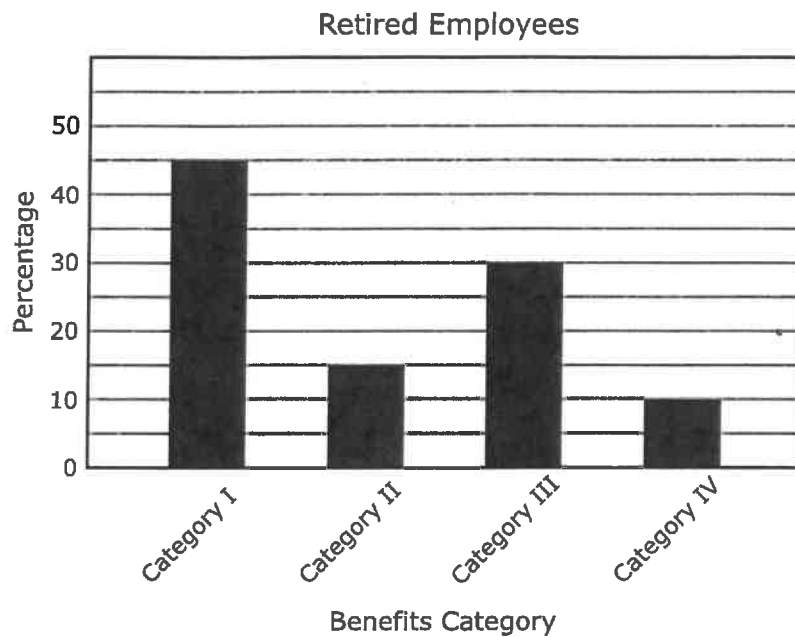
Which statement about the employees is supported by the data in the bar graph?

A More than half the employees are in Category I.

B The number of employees in Category II is twice the number of employees in Category III.

C The number of employees in Category II or Category III is greater than the number of employees in Category I.

D The number of employees in Category I is three times the number of employees in Category II.

11. ● The Venn diagram shows the relationships among different sets of numbers.
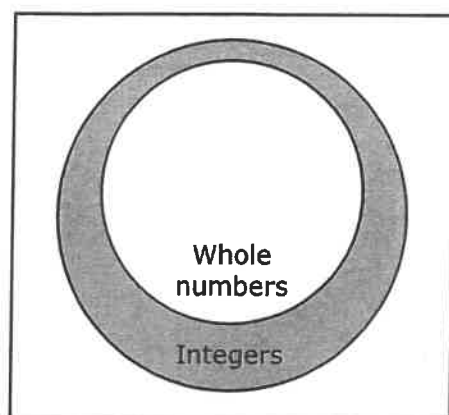
Which number would be located in the shaded part of the diagram?

A ● −1.7

B ● −8

C ● $\frac{2}{3}$

D ● 10

12 Which expression is equivalent to $16 + 2 \cdot 36$?

A ● $2^4 + 2^3 \cdot 3^2$

B ● $2^3 + 2^3 \cdot 3^2$

C ● $2^4 + 2^2 \cdot 3^2$

D ● $2^3 + 2^2 \cdot 3^3$

---

13 Alejandra has \$600 in her checking account. She wants to spend part of this money on a computer. She wants to have at least \$250 left in her checking account after buying the computer. The inequality shown can be used to find t, the amount of money in dollars that Alejandra can spend on the computer.

$$t + 250 \leq 600$$

Which inequality represents all possible values of t?

A $t \geq 350$

B $t \leq 850$

C $t \leq 350$

D $t \geq 850$

14 The table shows the portion of a day four students used to build a website.

Time Used

| Student	Portion of Day
Jamail	29.4%
Andrew	37.6%
Ernesto	$\dfrac{7}{25}$
Blake	$\dfrac{3}{10}$

Which list shows the students in order from the greatest amount of time used to the least amount of time used?

A Andrew, Blake, Jamail, Ernesto

B Blake, Andrew, Jamail, Ernesto

C Ernesto, Blake, Andrew, Jamail

D Andrew, Jamail, Ernesto, Blake

---

15 Consumers sometimes make choices that cause negative information to be put on their credit reports. Which of these is the most likely number of years that this negative information will remain on their credit reports?

A 3 to 6 years

B 7 to 10 years

C 11 to 14 years

D 15 to 18 years

16 Which number line represents the solution to $5x < 30$?

A

B

C

D
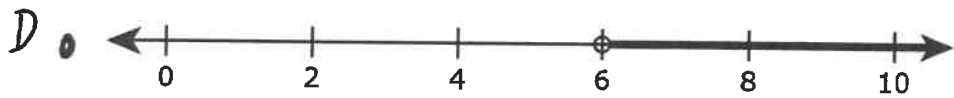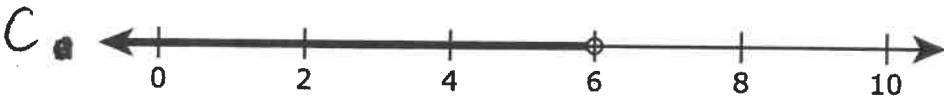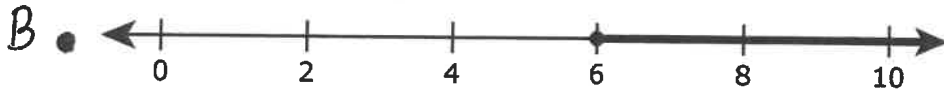
17 Triangle *PQR* is shown. Use the ruler provided to measure the dimensions of the triangle to the nearest $\frac{1}{2}$ inch.

P

R

Q
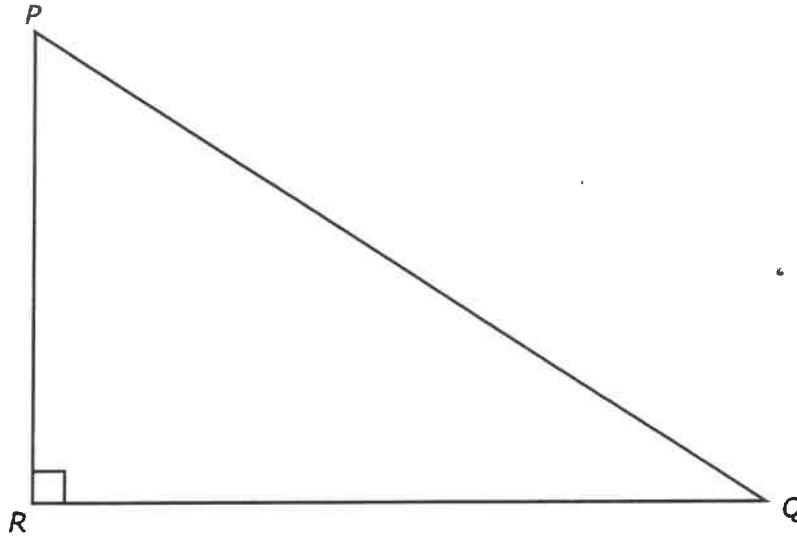
Which measurement is closest to the area of triangle *PQR* in square inches?

A 5 in.²

B $8\frac{3}{4}$ in.²

C $6\frac{1}{2}$ in.²

D 11 in.²

---

18 A pharmacist put 4.536 ounces of vitamin pills into bottles. She put 0.042 ounce of vitamin pills into each bottle.

How many bottles did the pharmacist use for these vitamin pills?

A ● 11

B ● 5

C ● 18

D ● 108

19 The stem and leaf plot shows the percentage of questions on a Spanish test that were answered correctly by each student in a class.

Spanish Test

Stem	Leaf
7	0 0 0 5 5 5 5 5
8	0 0 0 5 5 5
9	0 0 5 5
10	0

7|0 means 70%.

Which statement is true?

A Nine students answered 55% of the questions correctly.

B Half the students answered 70% or 75% of the questions correctly.

C Eight students answered more than 80% of the questions correctly.

D Ten students answered 100% of the questions correctly.

20 The table shows the time Monique worked and the amount of money she earned during four different weeks.

Monique's Earnings

Time Worked (hours)	Amount Earned (dollars)
15	123.75
20	165
24	198
30	247.50

Based on the information in the table, how much will Monique earn if she works 40 hours in a week?

A $330

B $255.75

C $297

D $82.50

2019 Mathletes Challenge Round 3 Test 2 - Answer Key

1. A	11. B
2. B	12. A
3. D	13. C
4. B	14. A
5. A	15. B
6. B	16. C
7. C	17. A
8. D	18. D
9. A	19. C
10. D	20. A