



Arkansas Comprehensive Testing, Assessment, and Accountability Program

RELEASED ITEM

BOOKLET

GRADE 8

AUGMENTED BENCHMARK EXAMINATION

April 2013

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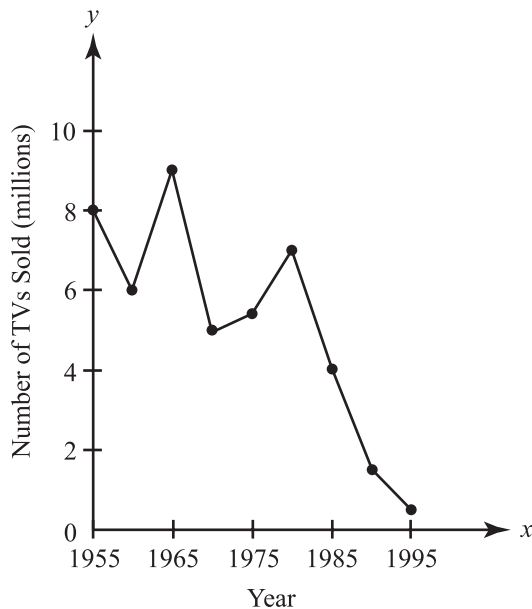
Arkansas Department of Education

CALCULATOR NOT PERMITTED—ITEMS 1–8



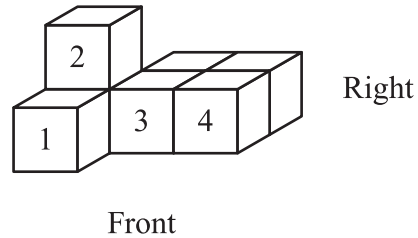
- 1 Which statement **best** represents the pattern of sales of black-and-white TVs as shown in the graph below?

Black-and-White TV Sales (1955–1995)



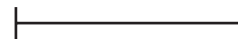
- * **A** The final decline of sales for black-and-white TVs began in 1980.
B The sales of black-and-white TVs continually decline for 40 years.
C The most drastic decline in black-and-white TV sales was from 1955–1960.
D There was a slight decrease in black-and-white TV sales between 1970–1975.

- 2 The building below is constructed out of 7 blocks.



One additional block needs to be added without changing the front or right side views. Where could the 8th block be added?

- A** on top of block number 1
B on top of block number 3
* **C** in front of block number 4
D in front of block number 1
- 3 Which is closest to the length of the line segment below?



- A** $1\frac{5}{8}$ inches
B $1\frac{3}{8}$ inches
C $1\frac{5}{16}$ inches
* **D** $1\frac{3}{16}$ inches

- 4 Look at the table below.

Student	Height	Long Jump Distance
1	63	60
2	65	68
3	59	57
4	65	61
5	61	54
6	62	60
7	64	59
8	63	66
9	66	68
10	68	74

Which type of display would be **most** appropriate to illustrate the distance a person can long jump and his/her height?

- * **A** scatter plot
 - B** circle graph
 - C** Venn diagram
 - D** box-and-whisker plot
- 5 A football field is 100 yards long from goal line to goal line. Sal ran half the length of the field before he was tackled. How many feet did he run?
- A** 50 feet
 - B** 100 feet
 - * **C** 150 feet
 - D** 300 feet

- 6 Amahl does computer repairs in his home. He charges a set fee to analyze the problem, plus an hourly rate for his labor. The table below shows C , the total charge to his customer, based on h , the number of hours of labor required.

Customer Charges

Number of Hours (h)	Total Charge (C)
2	\$39
4	\$63
6	\$87

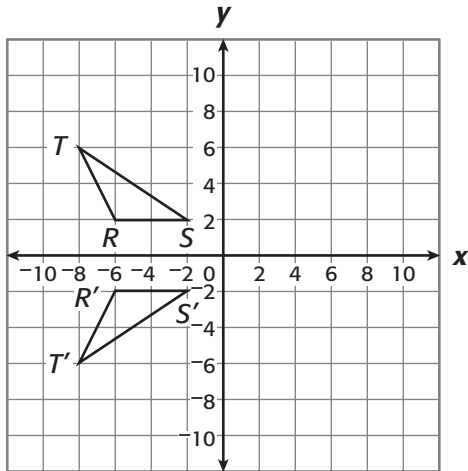
Which equation could Amahl use to determine his customer's total charge?

- A** $C = 9h + 21$
 - * **B** $C = 12h + 15$
 - C** $C = 15h + 9$
 - D** $C = 24h + 15$
- 7 Which illustrates the multiplicative identity property?
- A** $a(0) = 0$
 - * **B** $a(1) = a$
 - C** $a\left(\frac{1}{a}\right) = 1$
 - D** $a(1) = 1$

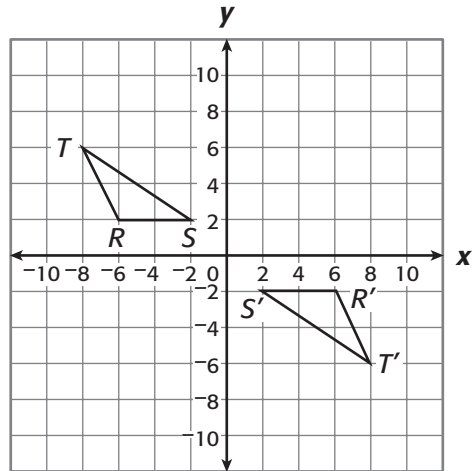
- 8 Triangle TRS is rotated 90° counterclockwise about the origin to form triangle $T'R'S'$.

Which graph shows this transformation?

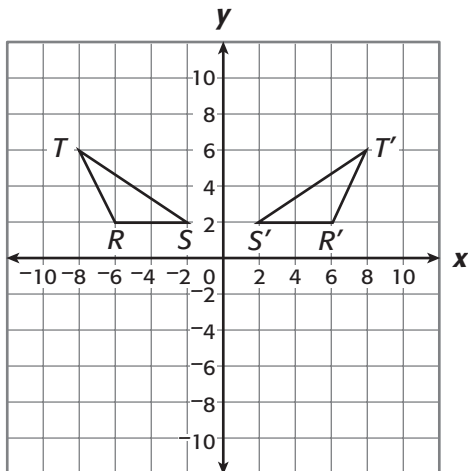
A



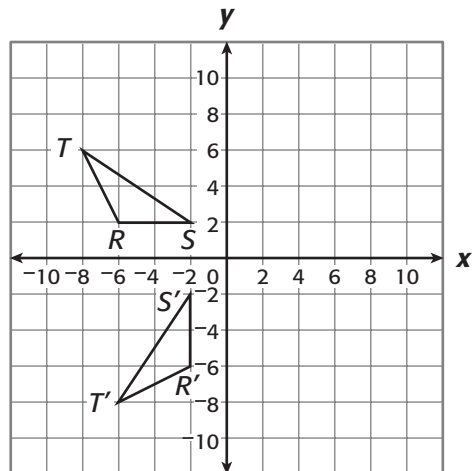
B



C



*** D**



CALCULATOR PERMITTED—ITEMS 9–20 and A–C



9 Which statement about squares and cubes is true?

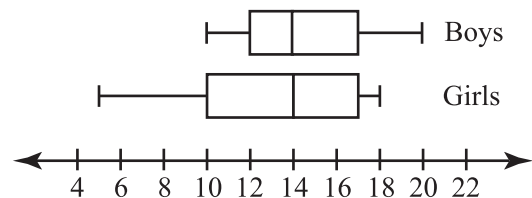
- * **A** A cube has 2 times as many vertices as a square.
- B** A cube has 3 times as many vertices as a square.
- C** A cube has 6 times as many vertices as a square.
- D** A cube has 12 times as many vertices as a square.

10 Which description describes the graph of $f(x) = -x^2 + 4$?

- A** a parabola that opens up with vertex at $(0, 4)$
- B** a parabola that opens up with vertex at $(0, -4)$
- * **C** a parabola that opens down with vertex at $(0, 4)$
- D** a parabola that opens down with vertex at $(0, -4)$

11 Boys and girls from Wilson Elementary School were surveyed to find out how many hours they used the computer each week. The results are shown in the box-and-whisker plot below.

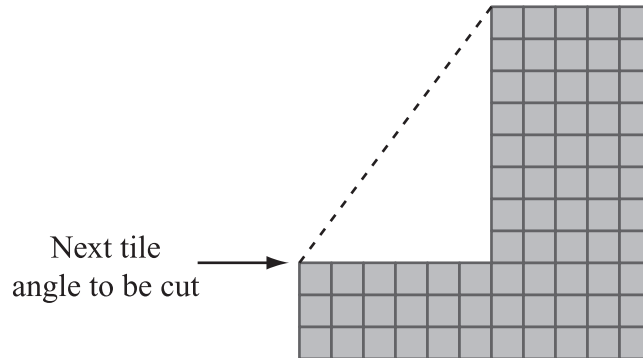
Weekly Computer Hours



What is the **best** conclusion from the data?

- A** The minimum number of hours the boys used the computer is less than the minimum number of hours the girls used the computer.
- B** The median number of hours the girls used the computer is more than the median number of hours the boys used the computer.
- * **C** The maximum number of hours the boys used the computer is higher than the maximum number of hours the girls used the computer.
- D** The highest number of hours the girls used the computer is more than the highest number of hours the boys used the computer.

- 12** Juan wants to put up a fence bordering the tiled patio shown below in order to create a garden in the shape of a right triangle. Each square tile shown below measures 1 foot per side.



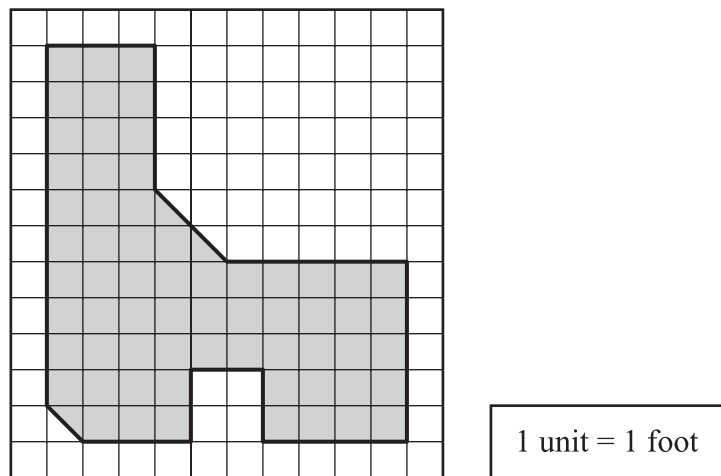
How many feet of fencing does Juan need?

- A** 5
*** B** 10
C 14
D 38
-
- 13** The price of a gallon of gas in one month was \$2.60. The following month, the price was \$2.99. What was the percent increase of the price of gas?
- A** 1.5%
B 13%
*** C** 15%
D 39%
- 14** What is the value of y for the equation shown when $x = -8$?
- $$y = 1.5x - 7$$
- A** -10
*** B** -19
C -22.5
D -44

- 15** A data set with 9 pieces of data has a mean of 70, a median of 71, a mode of 71, and a range of 10. If an outlier piece of data, 99, is included, which statement must be true?

* **A** The mean will increase.
B The range will decrease.
C The mode will become 99.
D The median will not change.

- 16** An odd-shaped bathroom floor to be tiled is shown as the shaded region in the diagram below.



The tile for the floor costs \$1.50 per square foot. How much will it cost to buy exactly the right amount of tile?

A \$ 65.50
 * **B** \$ 98.25
C \$196.50
D \$234.00

- 17** Which is equivalent to

$$10\left(\frac{(2+3)^2}{5}\right) + 4?$$

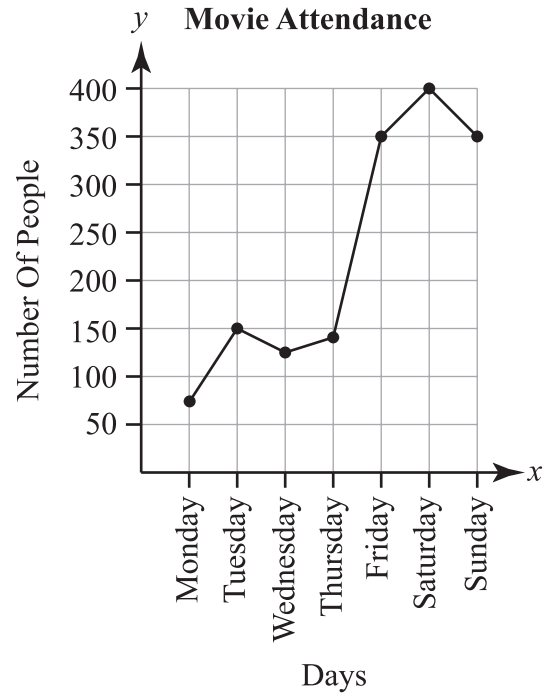
- A** 14
- B** 26
- C** 53
- * **D** 54

- 18** What is the greatest common factor (GCF) of the two terms shown below?

$$16x^2y \quad 64x^3y^3$$

- A** $8x^2y$
- B** $32x^2y$
- * **C** $16x^2y$
- D** $16x^2y^2$

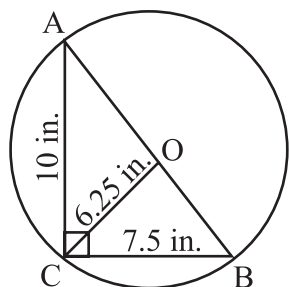
- 19** The graph below shows the number of customers at a local movie theater for one week.



Which measure of central tendency or measure of spread would result in the **lowest** value?

- * **A** median
- B** range
- C** mean
- D** mode

- 20** What is the perimeter of triangle ABC in the figure below?



- A** $\sqrt{17.5}$ inches
B $\sqrt{175}$ inches
C 18 inches
*** D** 30 inches

Mathematics Item A—2013 Grade 8

- A** Paulo has earned test scores of 87, 81, 82, 94, 89, and 96.
1. What is Paulo’s median test score? Show your work.
 2. What is Paulo’s mean test score? Round your answer to the nearest whole number. Show your work.
 3. Paulo wants to raise his mean score to be at least a 95. If there is only one more test this quarter, and the highest grade possible on a test is 100, can Paulo have a mean score of at least 95? Show your work or explain your response.

BE SURE TO LABEL YOUR RESPONSES 1, 2, AND 3.

Mathematics Item A Scoring Rubric—2013 Grade 8

Score	Description
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 – 3½ points.
2	The student earns 2 – 2½ points.
1	The student earns ½ – 1½ points, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

Solution and Scoring

Part	Points
1	<p>1 point possible:</p> <p>½ point: Correct answer: 88</p> <p>AND</p> <p>½ point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. 81, 82, 87, 89, 94, 96</p>
2	<p>1 point possible:</p> <p>½ point: Correct answer: 88</p> <p>AND</p> <p>½ point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. $\frac{(81 + 82 + 87 + 89 + 94 + 96)}{6} = 529 \div 6 = 88.\overline{16} \approx 88$</p>
3	<p>2 points possible:</p> <p>2 points: Correct answer: No it is not possible <i>Or correct answer based on Part 2</i> Correct and complete explanation or work shown Give credit for the following or equivalent: Ex. $\frac{81 + 82 + 87 + 89 + 94 + 96 + x}{7} \geq 95$ $529 + x \geq 665$ $x \geq 136$</p> <p>Ex. $\frac{529 + 100}{7} = \frac{629}{7} \approx 89.857142857$, so no</p> <p>Ex. $95 \times 7 = 665$; $665 - 529 = 136$ so he can't</p> <p>OR</p> <p>1 point: Correct answer, work is incomplete (some math is shown) Or An arithmetic or copy error is present in the work Or Correct and complete work shown</p>

Mathematics Item B—2013 Grade 8
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- B** A track coach recorded his runners' times on two different races. The information is in the table below.

Runner	Speed
Adam	50 m/10 s
Felix	200 m/1 min

- What is each runner's speed in km/hr? Show your work.
- Each runner began running in the same direction along a path from the same point. If each runner maintained his speed from Part 1 and ran for 15 minutes, how much distance, in km, would be between them? Show your work.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

Mathematics Item B Scoring Rubric—2013 Grade 8

Score	Description
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 – 3½ points.
2	The student earns 2 – 2½ points.
1	The student earns ½ – 1½ points, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

Solution and Scoring

Part	Points
1	<p>2 points possible:</p> <p>½ point: Correct answer: Adam's speed = 18 (km/hr)</p> <p>AND</p> <p>½ point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. $50 \times 6 = 300$; $300 \times 60 = 18000$; $18000 \div 1000 = 18$</p> <p>AND</p> <p>½ point: Correct answer: Felix's speed = 12 (km/hr)</p> <p>AND</p> <p>½ point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. $200 \times 60 = 12000$; $12000 \div 1000 = 12$</p>
2	<p>2 points possible:</p> <p>1 point: Correct answer: 1.5 (km) <i>Or correct answer based on Part 1</i></p> <p>AND</p> <p>1 point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. Adam: $0.25 \times 18 = 4.5$ km Felix: $0.25 \times 12 = 3$ km $4.5 - 3 = 1.5$ km Ex. Adam: $18 \times 15 \div 60$ Felix: $12 \times 15 \div 60$ $4.5 - 3 = 1.5$</p>

Mathematics Item C—2013 Grade 8

- C** The mean radius of the planet Mercury is 2.4×10^3 km.
1. The mean radius of the planet Neptune is approximately 10 times that of Mercury. Estimate the mean radius of Neptune and express the value in scientific notation.
 2. The volume formula for a sphere is $V = \frac{4}{3}\pi r^3$. What is the approximate volume of Neptune? Express your answer in scientific notation.
- BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

Mathematics Item C Scoring Rubric—2013 Grade 8

Score	Description
4	The student earns 4 points. The response contains no incorrect work. Correct units in Parts 1 & 2.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
B	Blank—No Response. A score of “B” will be reported as “NA.” (No attempt to answer the item. Score of “0” is assigned for the item.)

Solution and Scoring

Part	Points
1	<p>2 points possible:</p> <p>1 point: Correct answer: 2.4×10^4 km</p> <p>AND</p> <p>1 point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. $2.4 \times 10^3 \times 10 =$ Ex. $2400 \times 10 =$</p>
2	<p>2 points possible:</p> <p>1 point: Correct answer: 5.8×10^{13} km³ $5.790583579 \times 10^{13}$ km³ (using π) 5.787648×10^{13} km³ (using 3.14) <i>Or correct answer based on Part 1</i> <i>NOTE: Answers may be correctly rounded to any decimal place.</i></p> <p>AND</p> <p>1 point: Correct and complete explanation or work shown <i>Work may contain an arithmetic or copy error</i> Give credit for the following or equivalent: Ex. $V = 4 / 3\pi(2.4 \times 10^4)^3$ $V = 4 / 3\pi(1.3824 \times 10^{13})$ $V = 5.8 \times 10^{13}$ km³ Ex. $4 \div 3\pi(24000^3)$</p>