

Arkansas Comprehensive Testing, Assessment, and Accountability Program

# Released Item Booklet

# GRADE 8

# AUGMENTED BENCHMARK EXAMINATION April 2012

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#### **Arkansas Department of Education**

CALCULATOR NOT PERMITTED—ITEMS 1–6

1 A student draws the front view, right view, and top view of a building.



Which set of blocks could represent the building the student used to draw the different views?



2 Karen opened a savings account. She made deposits as shown in the graph below.



What is represented by the point (0, 100)?

- \* A the amount of money she opened the account with
  - **B** the amount of money she deposited every 2 weeks
  - **C** the total amount of money in the account after 1 week
  - **D** the total amount of money in the account after 2 weeks
- **3** Between which two whole numbers is  $\sqrt{82}$ ?
  - **A** 8 and 9
  - \* **B** 9 and 10
    - **C** 20 and 21
    - **D** 40 and 41

4 What is the **best** first step in solving

$$\frac{m}{2.8} - 6 = 10.5?$$

- **A** Multiply m and 10.5 by 2.8.
- **\* B** Add 6 to both sides of the equation.
  - **C** Subtract 6 from both sides of the equation.
  - **D** Subtract 10.5 from both sides of the equation.
- **5** A polynomial is shown below.

$$3x^2 - x^2 + y - 2y + y^2$$

Which of the following shows the polynomial in simplified form?

**A** 
$$2x^{2}$$
  
**B**  $y^{2} - y + 3$   
**\* C**  $2x^{2} - y + y^{2}$   
**D**  $y^{3} + 2x^{2} - 2y$ 

- 6 Sandra is conducting an experiment for a project on probability for her mathematics class. Which of the following number of trials of her experiment would make her data the **most** reliable?
  - **A** 5
  - **B** 50
  - **C** 500
  - \***D** 5000

CALCULATOR PERMITTED—ITEMS 7–20 and A–C

7 Which is the graph of  $y = \frac{1}{2}x + 3?$ 



- 8 The gift shop at the nature center is a cylinder with a cone-shaped ceiling. The radius of the gift shop floor is 20 feet and the height of the cylinder is 10 feet. The height of the cone is 12 feet. What is the volume of the gift shop? Use 3.14 for  $\pi$ .
  - **A** 5,024 cubic feet
  - **B** 9,211 cubic feet
  - **C** 12,560 cubic feet
  - \* **D** 17,584 cubic feet
- **9** Sean moved to a city that is  $1.1 \times 10^3$  miles from his grandparents' city. He then moved 200 miles closer to his grandparents' city. What is the new distance written in scientific notation?
  - **A**  $1.1 \times 10^{1}$
  - \* **B**  $9 \times 10^2$ 
    - **C**  $1.3 \times 10^3$
    - $\mathbf{D} \qquad 9 \times 10^3$

**10** Mindy rolled a 6-sided number cube and flipped a coin. What is the probability that the cube lands on 6 and the coin lands on tails?

\* **A** 
$$\frac{1}{12}$$
  
**B**  $\frac{1}{8}$   
**C**  $\frac{1}{6}$   
**D**  $\frac{1}{4}$ 

**11** What is the distance between Point *A* and Point *B* shown below?



- **A** 5 units
- **B** 12.4 units
- \* **C** 15 units
  - **D** 18 units

**12** What is the **approximate** area of the shape shown below?



- **C** 23.7 square inches
- **D** 30.2 square inches
- Jack noticed a pattern when working with the sum of the angles of a convex polygon. The interior angles of a 3-sided polygon add up to 180°. The interior angles of a 4-sided polygon add up to 360°. The interior angles of a 5-sided polygon add up to 540°. What will the interior angles of a 7-sided polygon add up to?
  - **A**  $540^{\circ}$
  - **B** 720°
  - **C** 880°
  - \***D** 900°

**14** The track coach handed out trophies at the sports banquet. Each trophy is the shape of the square pyramid shown below.



5 in.

What is the volume of each trophy?

- \* **A** 50 cubic inches
  - **B** 60 cubic inches
  - **C** 75 cubic inches
  - **D** 150 cubic inches

**15** What is the 7th term in the pattern below?



**16** Patricia wants to shrink the size of an image on a poster. The image has a length of 35 centimeters and a width of 28 centimeters. The shrunken image will be similar to the original image and has a width of 9 centimeters.

What will be the length of the shrunken image?

- **A** 2 centimeters
- **B** 7.2 centimeters
- \* **C** 11.25 centimeters
  - **D** 16 centimeters

**17** In the coordinate plane below, triangle *ABC* is flipped over a line of symmetry. The coordinates of the reflection are A'(1, -1); B'(3, -4); C'(0, -4).



What is the line of symmetry for the transformation?

- **A** x = 1
- \* **B** x = -1
  - $\mathbf{C} \quad y = 1$
  - **D** y = -1

**18** Which segment is 1.6875 inches long?



**19** The coordinates for the vertices of trapezoid *JKLM* are shown below.



If the midpoint is placed between points J and M, what is the distance between point M and the midpoint?

- **A** 0 units
- **B** 2 units
- **C** 3 units
- \* **D** 4 units
- **20** Terry made a square-shaped picture frame with an area of 196 square inches. What is the length of one side of his frame?
  - \* **A** 14 inches
    - **B** 28 inches
    - **C** 49 inches
    - **D** 98 inches

#### Mathematics Item A—2012 Grade 8

**A** The distance Jeff travels on his bicycle can be related to the number of revolutions the wheel of his bicycle makes. The following graph shows this relationship.



- 1. Write an equation that represents this relationship. Be sure to define the variables you use in your equation.
- 2. What is the value of the slope of the graph? Show your work or explain how you got your answer.
- 3. Describe what the slope in this context represents.
- 4. Use your equation to determine the number of revolutions the wheel makes when Jeff has traveled a total of 180 feet. Show your work or explain how you got your answer.

BE SURE TO LABEL YOUR RESPONSES 1, 2, 3, AND 4.

## Mathematics Item A Scoring Rubric—2012 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 - $2\frac{1}{2}$ points.
1	The student earns $\frac{1}{2}$ - $1\frac{1}{2}$ points, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
В	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	1 point possible:	
	1 point:	Correct equation with variables defined Ex. $y = 7.5x$ ; $y =$ feet traveled, $x =$ revolutions
	OR	
	½ point:	Both variables defined with an incorrect equation
2	1 point possible:	
	1 point:	Correct slope with work shown or explanation. Work can be from Part 1 Ex. 7.5 or equivalent; $\frac{30}{4} = 7.5$ $\frac{15}{2} = 7.5$ $\frac{30}{30} = \frac{15}{5}$
		4 2
	OR	
	½ point:	Correct slope without work or explanation
3	1 point possible:	
	1 point:	Correct description of the slope Ex. 1 revolution = 7.5 feet or "How many ft Jeff has travelled in x revolutions"
	OR	
	½ point:	Incomplete description of the slope
4	1 point possible:	
	1 point:	Correct answer with work shown or explanation Ex. $x = 24$ ; $180 = 7.5x$ , $\frac{180}{7.5} = \frac{7.5x}{7.5}$
	OR	
	1 point:	Correct answer based on an incorrect equation from part 1 with work or explanation shown
	OR	
	½ point:	Correct answer without work or explanation

#### Mathematics Item B—2012 Grade 8

- **B** A builder is renovating an office building. He is using a blueprint in which a scale of 0.75 inch represents 3 feet.
  - 1. The height of the building in the blueprint is 20.25 inches. How tall is the actual building? Show your work or explain your answer.
  - 2. The area of one square room in the building will be 144 square feet. What is the area of the room on the blueprint? Show your work or explain your answer.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

#### Mathematics Item B Scoring Rubric—2012 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 $2 - 2\frac{1}{2}$ points.
1	The student earns $\frac{1}{2}$ - $1\frac{1}{2}$ points, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
В	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	2 points possible:	
	2 points:	Correct answer and correct explanation shown Ex. 81 feet, 972 inches, 27 yards; $\frac{20.25}{x} = \frac{.75}{3}$ Ex. 20.25 × 3 = 60.75, 60.75 = .75 <i>x</i> , $\frac{.60.75}{.75} = .81$
	OR	
	$1\frac{1}{2}$ points:	Correct numerical answer with a correct explanation. The answer has incorrect units.
	OR	
	1 point:	Correct answer with an incomplete, incorrect or missing explanation
		or
		Correct explanation with arithmetic error
	OR	
	½ point:	Correct answer with missing or incorrect units

Part	Points	
2	2 points possible:	
	2 points:	Correct answer and correct explanation shown Ex. $A = 9 \text{ inches}^2$ ; $\frac{x}{12} = \frac{.75}{3}$ Ex. $A = 144 \text{ feet}^2 = s^2$ , $s = 12 \text{ feet}$ , $.75 \times 12 = 9$ , $\frac{9}{3} = 3$ , $3^2 = 9$
	OR	
	$1\frac{1}{2}$ points:	Correct numerical answer with a correct explanation. The answer has incorrect units.
	OR	
	1 point:	Correct answer with an incomplete, incorrect or missing explanation
		Or
		Correct explanation with arithmetic error
	OR	
	½ point:	Correct answer with missing or incorrect units

#### Mathematics Item C—2012 Grade 8

**C** Below is a picture of a model made of cubes.



Front

- 1. Draw the front view of the model.
- 2. Draw the right side view of the model.
- 3. Draw the left side view of the model.
- 4. Draw the back view of the model.

BE SURE TO LABEL YOUR RESPONSES 1, 2, 3, AND 4.

#### Mathematics Item C Scoring Rubric—2012 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 $\frac{1}{2}$ - $1\frac{1}{2}$ points, or some minimal understanding is shown.
0	The student earns 0 points. No understanding is shown.
В	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	1 Possible Point:	
	1 Point:	Correctly draws the front view of the model.
	OR	
	½ point:	Correctly drawn face of the front view with additional cubing to one block depth only

Part	Points
2	1 Point Possible:
	1 Point: Correctly draws the right side view of the model.
	OR
	<sup>1</sup> / <sub>2</sub> point: Correctly drawn face of the right side view with additional cubing to one block depth only



4       1 Point Possible:         1 Point:       Correctly draws the back view of the model.	
1 Point: Correctly draws the back view of the model.	
OR	
<sup>1</sup> / <sub>2</sub> point: Correctly drawn face of the back view with additional cu one block depth only	ubing to