



Arkansas Comprehensive Testing, Assessment and Accountability Program

Released Item Booklet

**Benchmark Examination
Grade 8**

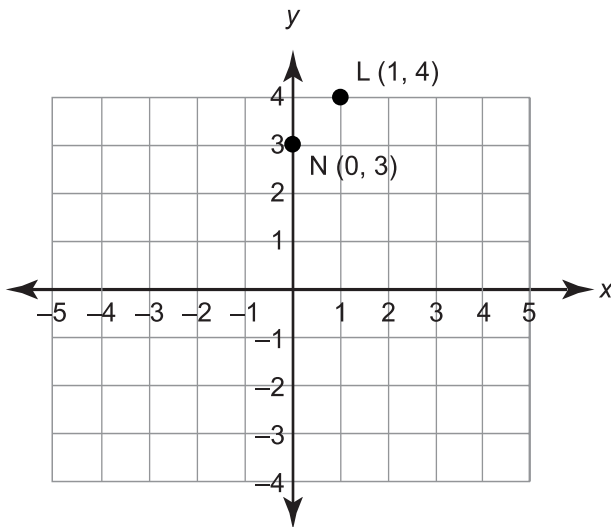
March 2005 Administration

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Arkansas Department of Education

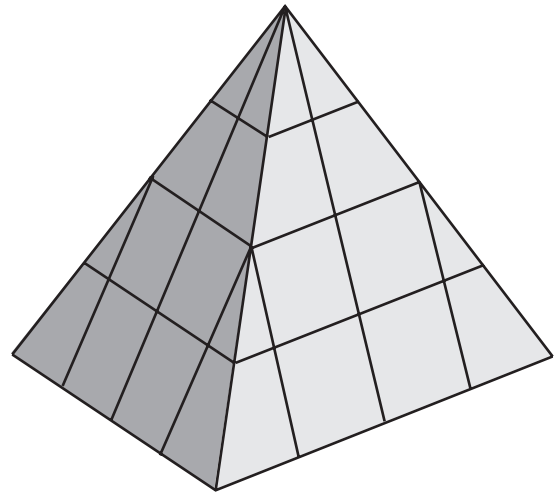
CALCULATOR NOT PERMITTED — ITEMS 1–8

1. What are the coordinates of the x -intercept of the line passing through N (0, 3) and L (1, 4)?



- * A. $(-3, 0)$
 B. $(0, 0)$
 C. $(-1, 0)$
 D. $(3, 0)$
2. Paulette's mother buys 3 raffle tickets at a school fund-raiser. Paulette finds out how many tickets were sold and calculates that her mother's theoretical probability of winning is 1 in 75. How many tickets were sold?
- A. 25
 B. 75
 C. 150
 * D. 225

3. Consider the following square pyramid.



What are the dimensions of the base and the height for this figure?

- A. base = 5 units by 5 units,
height = 4 units
 B. base = 5 units by 4 units,
height = 5 units
 C. base = 3 units by 5 units,
height = 3 units
 * D. base = 4 units by 4 units,
height = 4 units
4. Which measurement is **most** likely the height of a 3-story school building?
- A. 3 ft
 * B. 35 ft
 C. 325 ft
 D. 660 ft

5. At a store, Sigmond saw a bench that regularly costs \$24.75. The bench is now on sale at a 22% discount. The amount of discount (not including tax) is closest to which of the following dollar amounts?

A. \$2.00
 B. \$3.00
 C. \$4.00
 * D. \$5.00

6. A warehouse carries 500 **different** products. An inventory matrix is constructed, which includes the price of each product and how many of each product were sold each month (over a 12-month period).

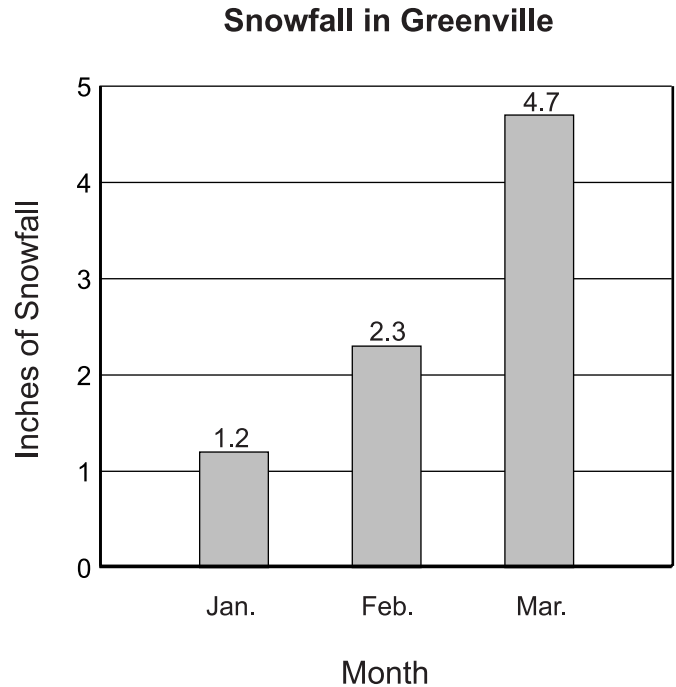
The total amount of money, in sales, can **most** easily be found if the warehouse manager enters the matrix into which of the following?

A. a cash register
 B. a fax machine
 C. a scientific calculator
 * D. a spreadsheet program

7. It takes 80 1-foot-by-1-foot tiles to cover a hallway. The hallway's length is 11 tiles greater than its width. What are the dimensions of the hallway?

A. 9 ft × 9 ft
 * B. 5 ft × 16 ft
 C. 4 ft × 20 ft
 D. 8 ft × 10 ft

8. The following graph displays the amount of snow that fell in Greenville last year. Which mixed number **best** represents the total number of inches Greenville received in January, February, and March?



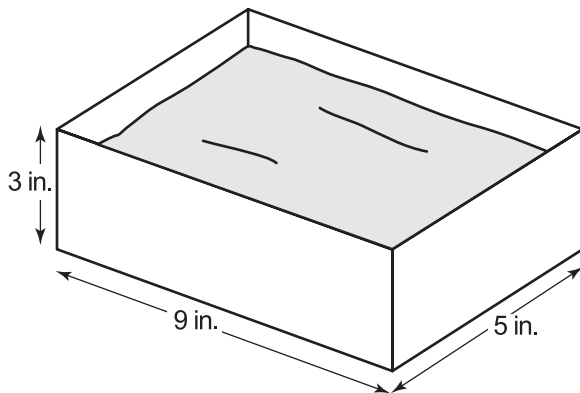
A. $7\frac{2}{10}$
 B. $7\frac{7}{5}$
 * C. $8\frac{1}{5}$
 D. $8\frac{12}{10}$

CALCULATOR PERMITTED — ITEMS 9–40

9. Mr. Herman has a fenced backyard. He keeps his dog attached to a stake in the center of the yard with a 3-meter-long cable. If the backyard is 7 meters by 12 meters, how much of the backyard is **not** used by the dog?

A. 28.26 square meters
* B. 55.74 square meters
C. 65.16 square meters
D. 84.00 square meters

10. José is using a cake pan, with the dimensions shown below, to make a cake. After he pours the batter into the pan, there is one inch remaining between the batter and the top of the pan. What is the difference in volume between the top of the cake pan and the batter?



* A. 45 cubic inches
B. 90 cubic inches
C. 135 cubic inches
D. 144 cubic inches

11. Claudia baby-sits for several families in her neighborhood. The following equation demonstrates how much Claudia charges to baby-sit.

$$T = 3h + 5$$

Let T = the total dollar amount due for baby-sitting, h = the number of hours she stays with the children, and 5 represent a base charge for the service.

Which of the following is **not** true?

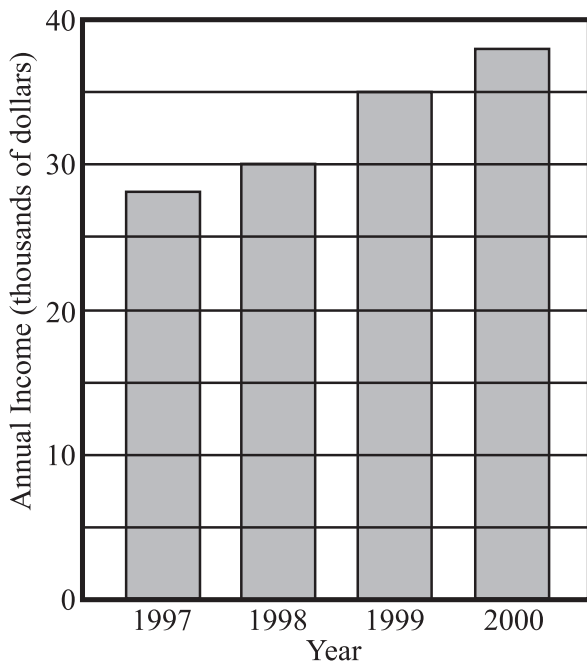
- A. The slope of this equation is equal to 3.
* B. The y -intercept in this equation is equal to 3.
C. If Claudia baby-sits for 6 hours, she will make \$23.00.
D. If Claudia baby-sits for 3 hours, she will make \$14.00.

12. What value represents $\sqrt{12}$, rounded to the nearest tenth?

A. 3.00
B. 3.4
C. 3.46
* D. 3.5

13. The bar graph below shows Mr. Wilson's annual income, in thousands of dollars, for the years 1997 to 2000.

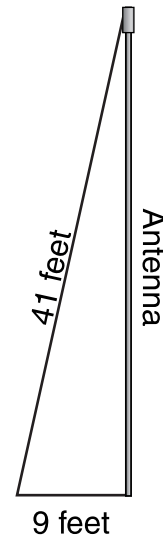
Mr. Wilson's Annual Income in 1997 – 2000



His annual income was about how much more in 1999 than in 1997?

- A. \$ 2,000
 - B. \$ 5,000
 - * C. \$ 7,000
 - D. \$10,000
14. Box A contains 3 cards, numbered 3, 4, and 5. Box B contains 3 cards, numbered 6, 7, and 8. If 1 card is drawn from each box and the sum is calculated, how many **different** sums are possible?
- A. 4
 - * B. 5
 - C. 6
 - D. 7

15. A 41-foot support wire is used to brace an antenna. The wire is anchored 9 feet from the base of the antenna (as shown in the picture). How tall, in feet, is the antenna?



- A. 32 ft
 - * B. 40 ft
 - C. 42 ft
 - D. 50 ft
16. Keisha is making curtains for her 2 living room windows. According to her pattern, a curtain for 1 window requires $12\frac{1}{3}$ yards of fabric. The roll of fabric Keisha bought at the craft store is 36 yards. How much fabric will be left over after Keisha cuts enough fabric for the 2 windows?
- * A. 11.33 yards
 - B. 12.00 yards
 - C. 23.66 yards
 - D. 24.66 yards

- 17.** John drove 50 miles east. He then turned around and drove 30 miles west. In this situation, the measurement of 80 miles **best** represents which of the following?

* A. the absolute value of the distance he traveled

B. the distance between his starting and ending points

C. the least common multiple of the two parts of his trip

D. the greatest common factor of the two parts of his trip

- 18.** So far this year in biology class, Carlos has received the following scores on his unit tests: 83, 87, and 95. In order to earn an “A” for the class, Carlos’s test average must be at least a 90. Which of the following algebraic equations would determine the minimum score that Carlos would need to achieve on the fourth test in order to earn an “A” in biology?

* A. $\left(\frac{265 + x}{4}\right) = 90$

B. $\left(\frac{265}{4} + x\right) = 90$

C. $\left(\frac{83 + 87 + 95 + 90}{4}\right) = x$

D. $83 + 87 + 95 + x = 90$

- 19.** George needs to buy eight feet of rope. At the hardware store, rope is sold in one-yard increments at \$2.00 per yard. How much money will George pay for the rope?

A. \$ 4.00

* B. \$ 6.00

C. \$12.00

D. \$36.00

- 20.** A recent study shows that, on average, 15% of men are left-handed and 9% of women are left-handed. For a school math project, Juan decided to test the accuracy of the study at his family reunion. Juan surveyed his family and found that out of 130 men, 25 were left-handed. What was the difference in percentage between the study’s findings and Juan’s?

* A. 4.2%

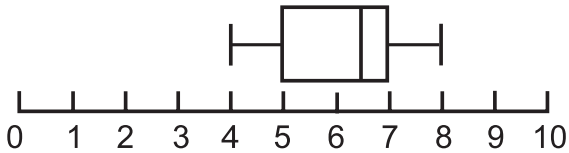
B. 6.0%

C. 10.2%

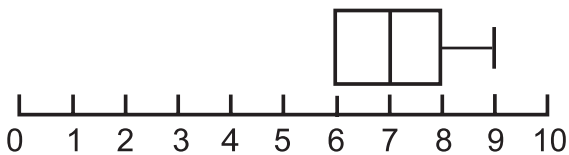
D. 19.2%

21. The following box-and-whisker plots represent the distribution of the ratings given to four movies by 20 newspapers and magazines.

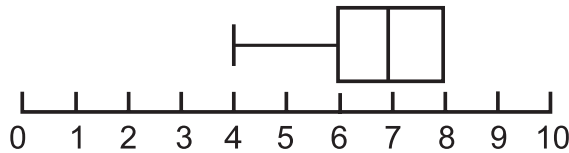
Movie A



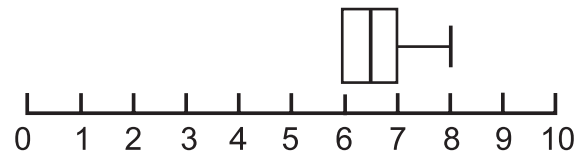
Movie B



Movie C



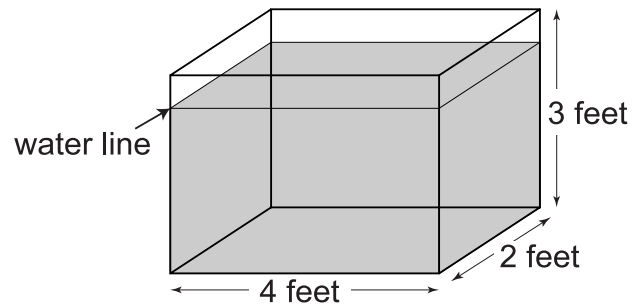
Movie D



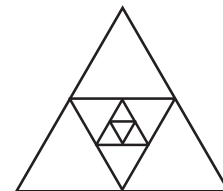
Based on these plots, which movie is the **most** highly recommended?

- A. Movie A
- * B. Movie B
- C. Movie C
- D. Movie D

22. Below is a picture of Petar's new aquarium. According to the instructions, Petar is supposed to fill the aquarium with water to the water line, leaving 3 inches of air between the water and the top of the tank. What is the volume of that air space, in cubic inches?



- A. 576 cubic inches
 - * B. 3,456 cubic inches
 - C. 10,287 cubic inches
 - D. 38,016 cubic inches
23. What is the number of lines of symmetry for the design below?



- A. 2
- * B. 3
- C. 6
- D. 9

- 24.** Sebastian owns his own furniture-making company. From 2000 to 2003, his revenue stayed constant at \$100,000. His general expenses increased by \$2,000 each year, while his property tax increased at a constant percentage rate each year. Sebastian knows that in order to calculate profit, he must subtract his general expenses and property tax expenses from his total revenue. If Sebastian's general expenses increase \$2,000 per year and his property tax continues to increase at the same percentage rate, what will be his profit for 2003?

Year	Total Revenue (in dollars)	General Expenses (in dollars)	Property Tax Expense (in dollars)
2000	100,000	10,000	2,500
2001	100,000	12,000	3,000
2002	100,000	14,000	3,600
2003	100,000		

- A. \$20,320
 B. \$79,500
 * C. \$79,680
 D. \$92,800
- 25.** An artist paints ceramic tiles to use for walls and floors. She paints every 3rd tile white, every 4th tile with a border, and every 5th tile with a flower. How often will she paint a tile white with a border and a flower?
- A. every 25th tile
 * B. every 60th tile
 C. every 70th tile
 D. every 210th tile

- 26.** Ned and Brandon are selling candy bars to help raise money for their school. For the last 3 days, they each sold the same number of candy bars, as shown below.

- Monday: 6 candy bars each
- Tuesday: 8 candy bars each
- Wednesday: 2 candy bars each

Which of the following function tables represents both boys' sales, if n represents the number of candy bars sold by Ned?

A.

n	$n + 2$
6	8
8	10
2	4

B.

n	$n \div 2$
6	3
8	4
2	1

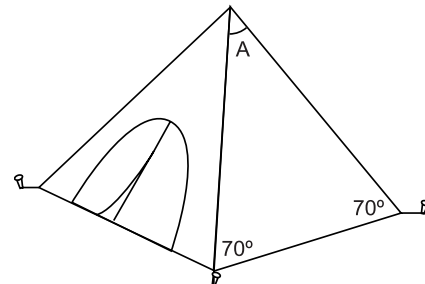
C.

n	$n - 2$
6	4
8	6
2	0

* D.

n	$n \times 2$
6	12
8	16
2	4

Use the graphic below to answer question 27.



- 27.** A camper sets up a tent, as shown above. What is the measure of angle A?
- A. 30°
 * B. 40°
 C. 70°
 D. 140°

28. Chandler read an article in a local newspaper that said if 35% of the city favored building a local community center, then the city government would donate money for the construction. Chandler decided to survey his neighborhood to determine how many people favored building the center. He surveyed 60 people. The results are listed below.

Survey Results for Chandler's Neighborhood

Vote	Number
For Community Center	45
Against Community Center	15

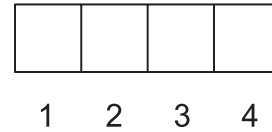
Which of the following statements is false?

- A. If the vote were based on Chandler's neighborhood alone, the city government would donate money to the construction of the center.
 - * B. Nine out of 11 people in Chandler's neighborhood favored the community center.
 - C. Twenty-five percent of Chandler's neighborhood was against building the community center.
 - D. Seventy-five percent of Chandler's neighborhood favored building the community center.
29. Jeremiah went to the grocery store to buy some chocolate candies for his grandmother. The grocery store carried two sizes of the candies. The 40-oz bag of candy was \$6.00. The 20-oz bag of candy was \$4.00. Jeremiah wants to get the most he can for his money. How much money will he save per ounce if he buys the larger bag?
- A. 3 cents
 - * B. 5 cents
 - C. 15 cents
 - D. 20 cents

30. A cubical box's vertical faces are decorated with this symbol:



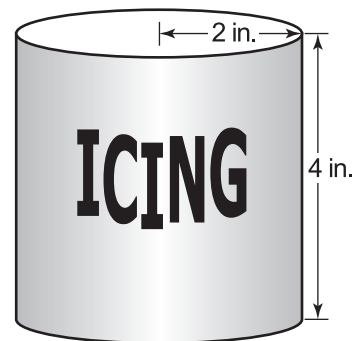
On each successive face from 1 through 4 the symbol is rotated 90° clockwise:



A student looking at the box might see which of the following?

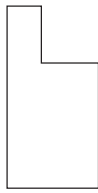
- A.
- B.
- * C.
- D.

31. The tub of icing below is 4 inches tall with a radius of 2 inches. What is the **approximate** volume of the tub of icing?

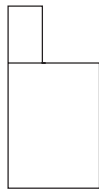


- A. 25 in.²
- B. 25 in.³
- C. 50 in.²
- * D. 50 in.³

- 32.** The front and side views of a building are as follows:



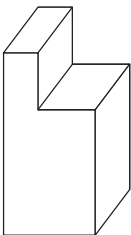
Front



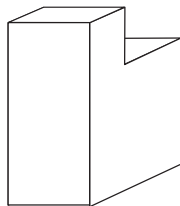
Side

Which of the following is a possible perspective of the building?

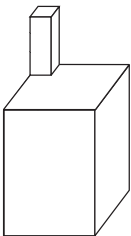
A.



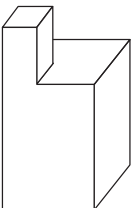
B.



C.



* D.



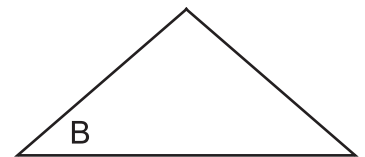
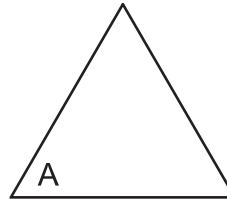
- 33.** A runner competes in 5 one-mile races. His first 4 times are as follows:

4:05 4:15 4:20 4:15

If the runner achieves his mode time for the first 4 races on the 5th run, what will be his mean time for the entire competition?

- A. 4:12.5
- * B. 4:14
- C. 4:15
- D. 5:17.5

- 34.** Valerie is redesigning her guest bathroom. Part of her project includes re-tiling her shower. Valerie wants to incorporate a design with colored tiles and needs help measuring the angles to create the design. Below is a sketch of the tiles she is using. Use your protractor to measure angles A and B. What is the difference between the measure of angles A and B?



- A. 11°
- * B. 19°
- C. 79°
- D. 139°

- 35.** Jean plotted the main areas of her town on a grid and treated each intersection as if it were a coordinate marker. Jean started in the center of town at (0, 0). She then walked two blocks directly north, two blocks directly east, and two blocks directly south. What is her new location with respect to (0, 0)?

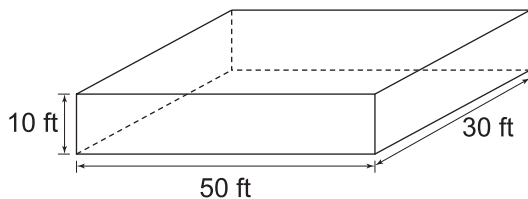
- * A. two blocks east from the origin
- B. two blocks north and four blocks east from the origin
- C. two blocks east and two blocks south of the origin
- D. four blocks east and four blocks south of the origin

36. The chart below is a partially filled-in score card for a video game contest. Joshua, Tara, and Shawna each played in all of the three games. There were no ties. What is the minimum possible score for Shawna in this tournament?

Video Game Score Card

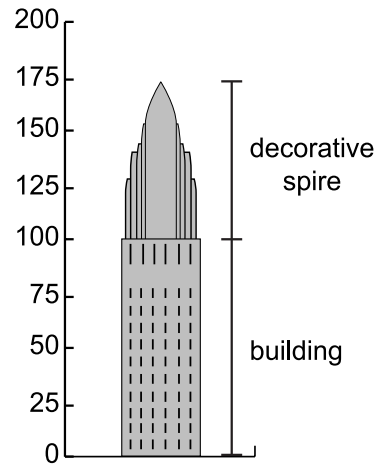
	1st Place (6 points)	2nd Place (4 points)	3rd Place (2 points)
Game 1			
Game 2		Tara	
Game 3			Tara

- A. 2
B. 6
* C. 8
D. 10
37. Jonathan plans to paint his dance studio and needs to calculate the area of the surfaces to determine how much paint to buy. A drawing of this room and its measurements appears below. Jonathan will paint his ceiling and all four walls. Compute the total area of these surfaces.



- A. 2,100 ft²
B. 2,600 ft²
* C. 3,100 ft²
D. 4,600 ft²

38. The decorative spire occupies what fraction of this structure's height?

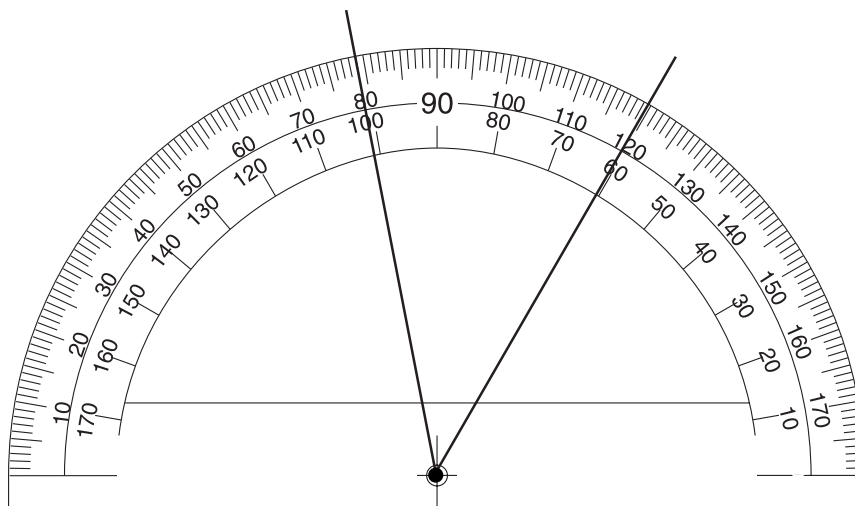


- A. $\frac{3}{4}$
* B. $\frac{3}{7}$
C. $\frac{4}{3}$
D. $\frac{4}{7}$
39. If two numbers add up to 90 and one number is two times the other, what is the larger of the two numbers?

- A. 30
B. 32
* C. 60
D. 88

PART II Released Mathematics Items

40. A student is going to measure an angle using a protractor, but is not sure how. The student places a protractor over an angle with the vertex of the angle at the center of the protractor, as shown.

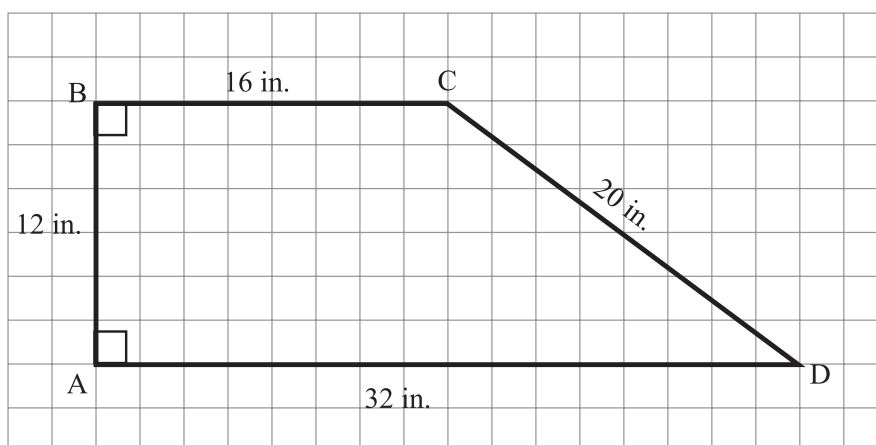


What is the **best** estimate of the measure of the angle?

- * A. 40°
- B. 60°
- C. 80°
- D. 160°

MATHEMATICS OPEN-RESPONSE ITEM A

A. Examine the trapezoid below.



1. Copy the trapezoid above onto the grid provided in your answer document. Draw two line segments in the trapezoid to form three congruent triangles.
2. Find the area of trapezoid ABCD. Show all your work or explain your answer.
3. Compare the area of the trapezoid to the area of one of the triangles. Explain the relationship between the two areas.

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM A

SCORE	DESCRIPTION
4	The student earns 4 points. The response contains correct label of “Sq. In.” in Part 2 and contains no incorrect work.
3	The student earns 3 – 3 ½ points.
2	The student earns 2 – 2 ½ points.
1	The student earns ½ – 1 ½ points or shows some minimal understanding.
0	No understanding is shown.
B	Blank – No Response. A score of “B” will be reported as “NA” (No Attempt – Zero Score).

Solution and Scoring

Part 1: (1 point possible)

Answer: 1 point for correct and complete drawing of the trapezoid with two line segments showing three congruent triangles inside the trapezoid as shown in the following diagram. (Dimensions are not required.)

Note: Give credit if drawn trapezoid is similar (proportional) to given diagram.

PART II Released Mathematics Items

MATHEMATICS OPEN-RESPONSE ITEM B

Table A

Outcome	Number of Times It Occurs
Coin lands heads up	58
Coin lands tails up	42

- B.** If a fair coin is dropped on a hard surface, there are two possible outcomes; the coin lands heads up or it lands tails up. Kalifa dropped a coin 100 times and recorded the results in Table A above.
- Based on the table, if Kalifa’s coin is dropped once, what is the probability that it would land heads up? What is the probability that it would land tails up? Show all your work or explain your answer.
 - Based on the table, if Kalifa’s coin is dropped 500 times, how many times would you expect it to land heads up? Explain your answer.
 - Explain why the theoretical probability of a heads-up landing could be **different** from the experimental probability shown in Table A.

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM B

SCORE	DESCRIPTION
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 – 3 ½ points.
2	The student earns 2 – 2 ½ points.
1	The student earns ½ – 1 ½ points or shows some minimal understanding. Example: The student explains that Theoretical Probability is ½ for H and/or T in Parts 1 and 3 with no points awarded in any other part.
0	No understanding is shown.
B	Blank – No Response. A score of “B” will be reported as “NA” (No Attempt – Zero Score).

PART II Released Mathematics Items

MATHEMATICS OPEN-RESPONSE ITEM C

- C. To raise money, 3 students are designing T-shirts and selling them for \$12.00 each at a football game. The cost of the materials for one shirt is \$3.50. The rental fees for the screening machine are detailed in the table below.

Rental Fee for Screening Machine	
Fee Schedule	Cost (in Dollars)
First hour	\$150.00
Each additional hour	\$ 50.00
Each additional half-hour	\$ 30.00

- Write an expression that represents the total cost of making x number of T-shirts for the first hour.
- How many T-shirts must be sold in order to take in \$660.00? Show all your work or explain your answer.
- It took a total of $2\frac{1}{2}$ hours to screen the number of T-shirts found in Part 2. How much money did the students spend on the rental fee and materials? Show all your work or explain your answer.
- How much money did each student earn (in profit) if each of them did an equal amount of work for the entire $2\frac{1}{2}$ hours? The students took in a total of \$660.00. Show all your work or explain your answer.

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM C

SCORE	DESCRIPTION
4	The student earns 4 points. The response contains correct units in Parts 3 and 4 and contains no incorrect work.
3	The student earns 3 – 3 ½ points.
2	The student earns 2 – 2 ½ points.
1	The student earns ½ – 1 ½ points or shows some minimal understanding. Example: The student correctly calculates (work shown) rental fee or material cost in Part 3 with no credit in any other part. Example: The student assumes “take in” and profit are the same in Part 4. $660 \div 3 = 220$ (work shown)
0	No understanding is shown.
B	Blank – No Response. A score of “B” will be reported as “NA” (No Attempt – Zero Score).

PART II Released Mathematics Items**MATHEMATICS OPEN-RESPONSE ITEM D****Lake-Weed Plants**

Month	Number of Plants
1	1
2	4
3	7
4	10
5	13
6	16

- D.** A single seed from a lake-weed plant drifts into a pond. During the first month, a student begins counting the number of these plants found in the pond and continues to count them in 1-month intervals. She produced a chart of her observations as shown above.
- Using the grid in your answer document, graph the data points using all the appropriate graphing techniques.
 - If the number of plants increases at the same rate, estimate how many plants will be observed in the 12th month. Explain your answer.

BE SURE TO LABEL YOUR RESPONSES 1 AND 2.

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM D

SCORE	DESCRIPTION
4	The student earns 4 points. The response contains no incorrect work.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point or shows some minimal understanding. Example: “The number of plants increases by 3 each month” with no credit in any other part. Example: The x and y are reversed, graph has error(s) and/or omissions but understanding is shown. No credit in any other part.
0	No understanding is shown.
B	Blank – No Response. A score of “B” will be reported as “NA” (No Attempt – Zero Score).

PART II Released Mathematics Items**MATHEMATICS OPEN-RESPONSE ITEM E****Average Daily Speeds**

Day 1	30 mph
Day 2	33 mph
Day 3	42 mph
Day 4	47 mph
Day 5	40 mph
Day 6	48 mph

- E. Lucille took an 8-day, 2,100-mile driving trip. During the trip, she drove 6 hours per day. The table above shows the average daily speed for the first 6 days of the trip. Use the formula $d = rt$, where d is the distance, r is the average speed, and t is the time, to answer the questions below.
1. What was the total mileage for the first 6 days of the trip? Show your work.
 2. What was Lucille's average speed for the first 6 days of her trip considering that she drove for a total of 36 hours? Show your work.
 3. What was Lucille's average speed for days 7 and 8 considering she traveled 2,100 miles total? Show your work.

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM E

SCORE	DESCRIPTION
4	The student earns 6 points. The response contains no incorrect labels or other incorrect work.
3	The student earns 5 points.
2	The student earns 3 – 4 points.
1	The student earns 1 – 2 points or shows some minimal understanding.
0	No understanding is shown. Example: $30 + 33 + 42 + 47 + 40 + 48 = 240$.
B	Blank – No Response. A score of “B” will be reported as “NA” (No Attempt – Zero Score).