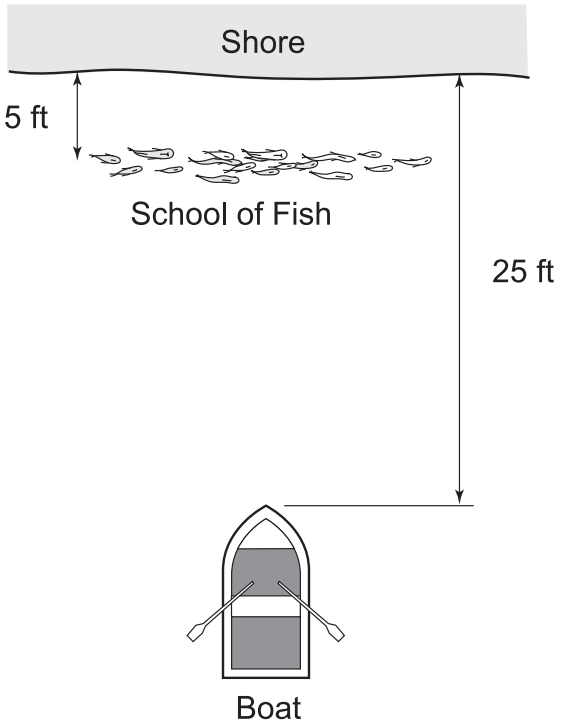
CALCULATOR NOT PERMITTED — ITEMS 1–8

1. Janice is in a boat 25 feet from the shoreline, and a school of fish is swimming about 5 feet from the shore.



What fractional part of the total distance **best** describes the distance between the boat and the school of fish?

A. $\frac{1}{4}$

B. $\frac{1}{5}$

C. $\frac{3}{4}$

* D. $\frac{4}{5}$

2. Joseph is at the grocery store purchasing cereal. He notices that his favorite cereal brand is advertising that there is 20% more cereal in the box for free.

22-Ounce Box
Price – $3.75

What additional information should be shown in the advertisement in order for Joseph to determine whether the claim is valid or not?

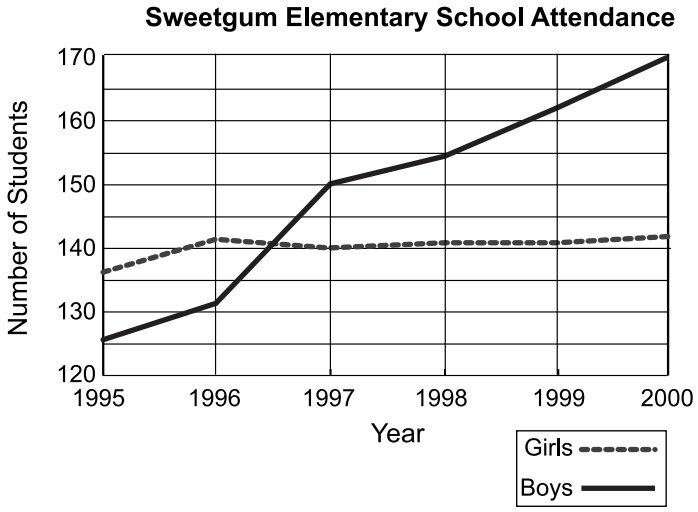
A. the nutritional content of the cereal

* B. the previous cost and weight of the cereal

C. the number of ounces in the box before the advertisement

D. the dimensions of the box before and after the advertisement

3. According to the Sweetgum Elementary School attendance chart, which of the following is true of attendance between 1997 and 2000?



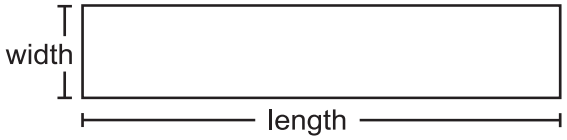
* A. The boys' attendance increased each year.

B. The overall attendance of the school declined.

C. There was a steady decline in the attendance of boys.

D. There was a steady decline in the attendance of girls.

4. A rectangle is $2w$ feet wide. If its length is 5 times longer than its width, what is the area of the rectangle?



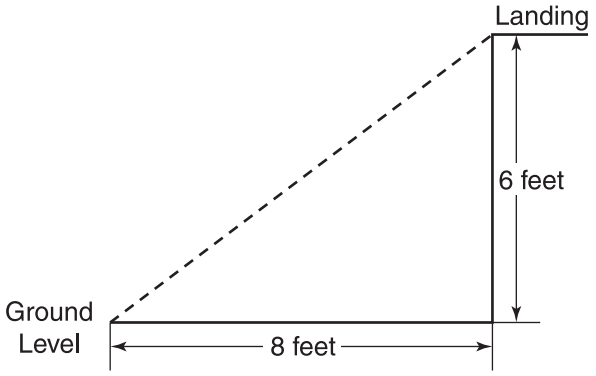
A. $10w$

B. $10w^2$

* C. $20w^2$

D. $44w$

5. Mary is building stairs to connect a lower level to a landing area 6 feet higher. Building codes state that the height of each step can be no more than 9 inches and the depth of each step must be at **least** 11 inches.



What is the minimum number of steps Mary will have to build in order to follow the building codes?

A. 6

B. 7

* C. 8

D. 9

6. A large financial institution trading on the New York Stock Exchange listed its highest selling price in the last year at $80\frac{3}{8}$ points. The difference between its highest and lowest prices was $26\frac{1}{2}$ points. What equation would be used to find the lowest selling price, x?

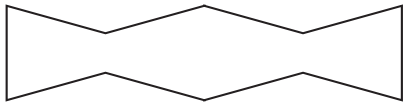
* A. $80\frac{3}{8} - x = 26\frac{1}{2}$

B. $26\frac{1}{2} - 80\frac{3}{8} = x$

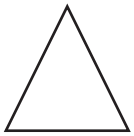
C. $80\frac{3}{8} \div 26\frac{1}{2} = x$

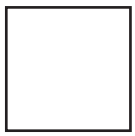
D. $80\frac{3}{8} + x = 26\frac{1}{2}$

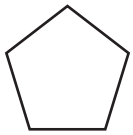
7. Tamara designed the shape below using four identical blocks:



Which of the following blocks did she use?

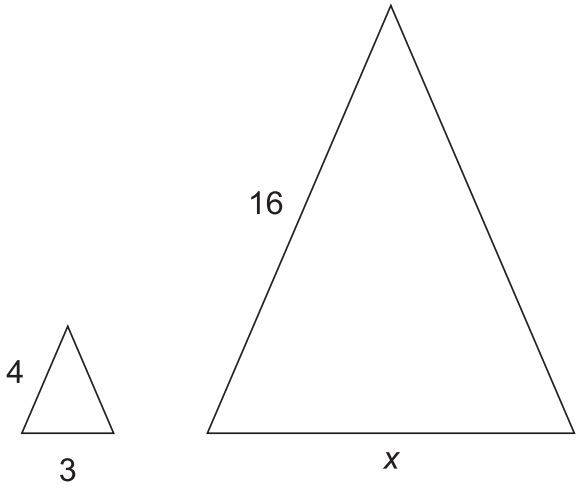
A. 

B. 

C. 

* D. 

Use the figures below to answer question 8.



8. The triangles above are similar. What is the length of side *x*?

A. 9

* B. 12

C. 15

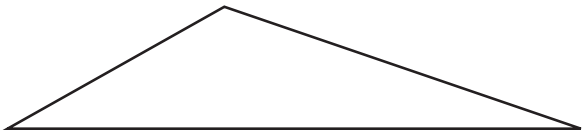
D. 21.3

CALCULATOR PERMITTED — ITEMS 9–40

9. Suppose Kenya scored 97, 75, and 80 on her first 3 math quizzes. What must her score be on the 4th quiz so that her mean score is 85?

A. 84
B. 85
C. 86
* D. 88

Use the figure below to answer question 10.



10. Which type of triangle is shown above?

A. right
B. acute
* C. obtuse
D. equilateral

11. Jamie is playing a video game. The longer he plays, the higher the point value becomes, doubling every 2 minutes. If the point value at the beginning of the game was 10, what would be his new point total if he were to play for 10 full minutes?

A. 32
* B. 320
C. 1,024
D. 10,240

12. For which of the following would a yard be the **most** appropriate unit to measure length?

A. the volume of a bus
B. the area of a street sign
* C. the length of a cafeteria table
D. the distance from Arkansas to Ohio

Use the equations below to answer question 13.

$$n + 2 = 3$$

$$n - 2 = 3$$

$$n + 3 = 11$$

$$n - 11 = 3$$

13. To solve for *n,* one of the equations above would need to have 3 subtracted from both sides of the equation. Which equation is it?

A. $n+2=3$
B. $n-2=3$
* C. $n+3=11$
D. $n-11=3$

14. Sally is drawing blue, pink, and white cubes out of a bag. The following table shows the results of her trials and outcomes.

Trial	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Outcome	B	P	W	W	W	P	B	W	P	P	B	W	W	P	W	P	W	W	P	W

Key: B = Blue P = Pink W = White

How many **different** possible outcomes are there in each trial?

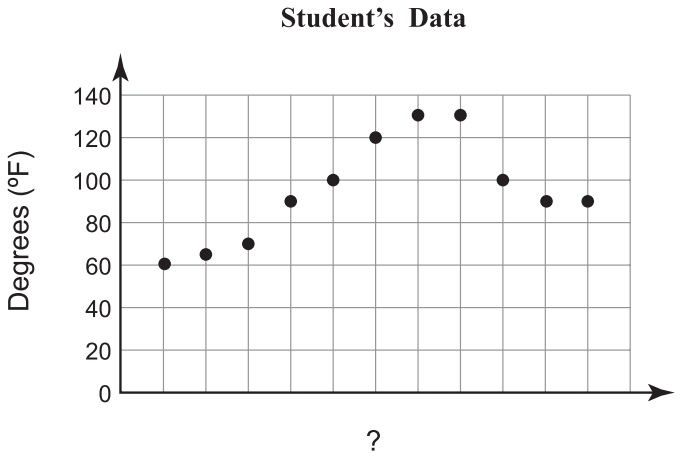
A. 1

* B. 3

C. 10

D. 20

15. A student decides to measure the temperature in a parked vehicle during the day for a class experiment. The student collected the data and organized it into a graph shown below.



What label would **most** likely appear for the bottom axis?

A. Temperature Outside

B. Number of Cars in Parking Lot

C. Number of Measurements Taken

* D. Time At Which The Temperature Was Measured

16. Fill in the missing numbers in the following Fibonacci sequence, where each element of the pattern is the sum of the previous two elements.

0, 1, 1, 2, 3, 5, 8, __, __, __, 55, 89 . . .

A. 9 16 25

* B. 13 21 34

C. 15 20 35

D. 16 24 32

17. Cathy is building a ramp and she needs to make sure that the angle she measures is no more than 25 degrees. To ensure that her measurements are correct, what tool would be the **best** choice to directly measure an angle for this project?

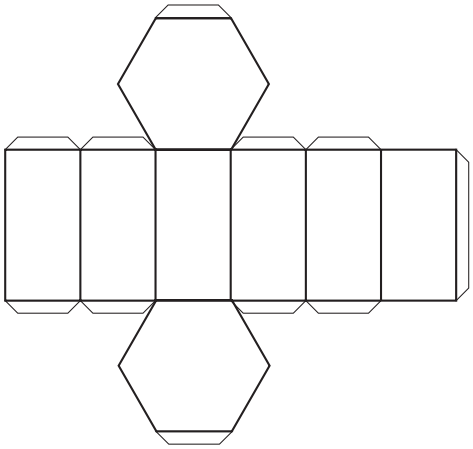
A. scale

B. ruler

C. compass

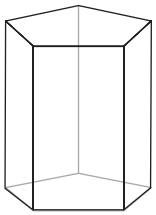
* D. protractor

18. The pattern below can be folded into a polyhedron:

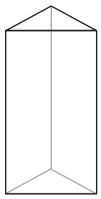


Which of the following polyhedra would the pattern represent if folded properly?

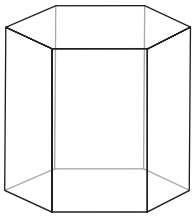
A.



B.



* C.



D.

19. In the metric system, what might a high school freshman weigh?

A. 50 grams

B. 500 grams

* C. 50 kilograms

D. 50 milligrams

20. Which is an algebraic expression for the following?

"one number that is 6 greater than 2 times another number"

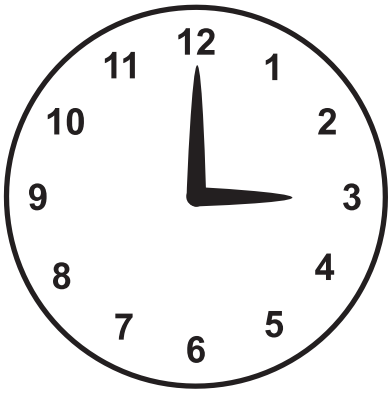
A. $2x - 6$

B. $x + 6$

* C. $2x + 6$

D. $x(6 + x)$

21. It was 3 o'clock when Joe checked the clock.



What time did the clock show after the hour hand moved 60 degrees?

A. 3 o'clock

* B. 5 o'clock

C. 6 o'clock

D. 9 o'clock

22. What measurement could represent the length of an average seventh-grader's thumb?

A. 4 meters

B. 4 inches

C. 4 millimeters

* D. 4 centimeters

23. There are 15 boys and 10 girls in a classroom. They all put their names in a hat, and the teacher draws out 5 names. The teacher looks at the names and discovers that all 5 names belong to boys. What is the probability that the next name drawn will belong to a boy?

A. $\frac{2}{5}$

B. $\frac{1}{15}$

* C. $\frac{1}{2}$

D. $\frac{3}{5}$

24. At a given time in the rotation around Earth, the moon is approximately 2.4×10^5 miles from Earth. If Earth is approximately 8.0×10^3 miles in diameter, how many Earth-sized spheres would fit between Earth and the moon at this time?

A. 0.0333

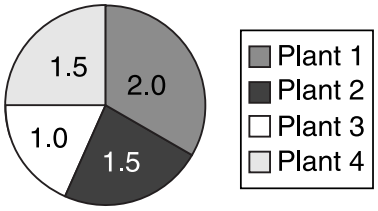
B. 3

* C. 30

D. 300

25. Sinclair is performing a science experiment by measuring the height of four growing plants. He records how tall each plant is for a period of five days. Which of the charts below would **best** record his data?

A. **Total Height for Plants (in centimeters)**

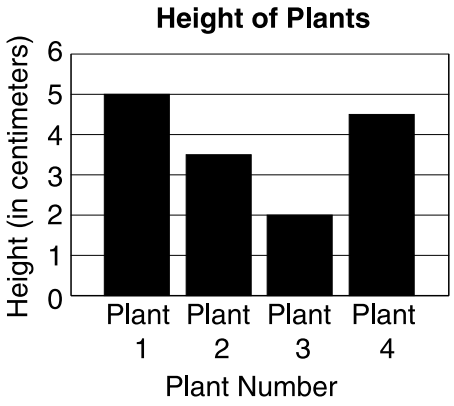


B.

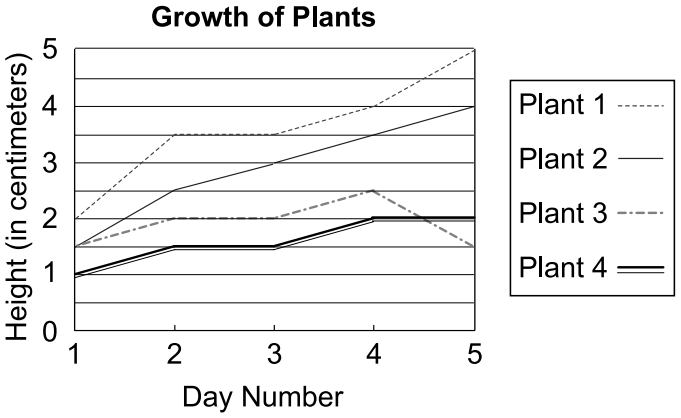
	PLANT GROWTH
Plant 1	△
Plant 2	△ △
Plant 3	◿
Plant 4	△ △ △ ◿

△ = 3 inches

C.



* D.



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26. Jerrod measured his pencil during class and obtained an incorrect measurement. He measured it in centimeters, when he was supposed to measure it in inches. To the nearest tenth of an inch, what length should he have found?

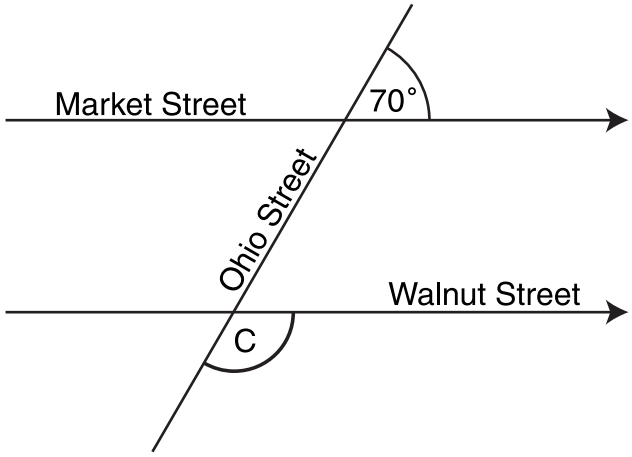
A. 4.0 inches

* B. 4.4 inches

C. 5.0 inches

D. 11.1 inches

27. Market Street and Walnut Street are parallel. Ohio Street crosses both streets as shown in the diagram. What is the measure of ∠C, formed at the intersection of Walnut and Ohio Streets?



A. 20°

B. 70°

* C. 110°

D. 180°

28. Andy ordered 4 pizzas to serve 12 people at a party. Each pizza has 15 slices. How many slices will there be for each person?

A. 3.2

* B. 5

C. 8

D. 10

29. The sum of three consecutive numbers is 21. What are the three numbers?

A. 5 8 8

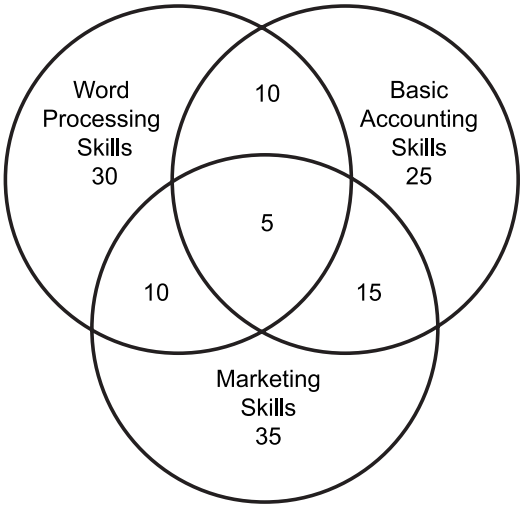
B. 7 7 7

* C. 6 7 8

D. 7 8 9

30. Mr. Cole constructed a diagram to illustrate the skills of applicants for positions in his company.

Applicant Job Skills



How many applicants possess word processing, basic accounting, and marketing skills?

* A. 5

B. 10

C. 15

D. 20

31. An architect wants to build a tower that has the same proportions as a famous monument. The height of the famous tower is 123 feet and the width is 18 feet. If the width of the new tower is to be 10 feet, how tall should it be?

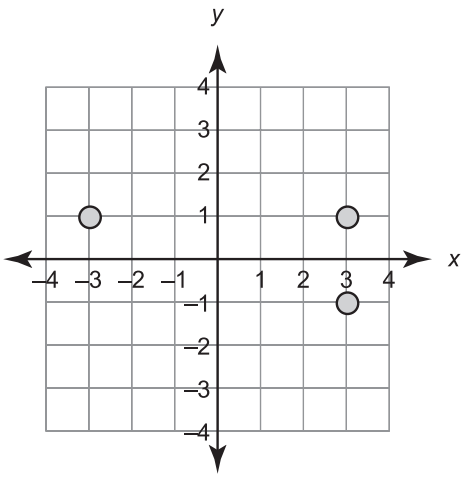
A. 1.46 ft

B. 14.60 ft

* C. 68.33 ft

D. 221.4 ft

32. In the following graph, which of the following coordinates would complete the four corners of a rectangle?



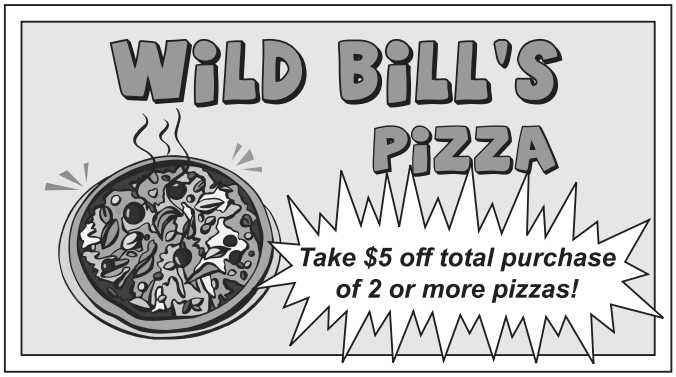
A. (3, 1)

B. (–3, 1)

C. (–3, 2)

* D. (–3, –1)

33. Kyle ordered 7 large pepperoni pizzas from Wild Bill's Pizza, and he used the coupon shown below.



If the total bill, after Kyle used the coupon, was $82.50, what was the regular price of 1 pizza?

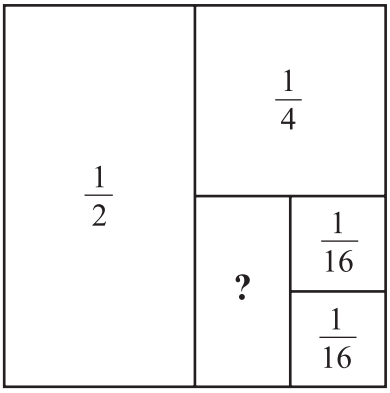
A. $11.00

B. $11.80

* C. $12.50

D. $16.80

34. The box below shows the relationship between various fractions.



Which fraction should replace the **?** shown in the box?

A. $\frac{1}{2}$

* B. $\frac{1}{8}$

C. $\frac{1}{16}$

D. $\frac{1}{32}$

35. If there are 12 donuts in a box and Claire eats 2 donuts, what percentage of the donuts did she eat?

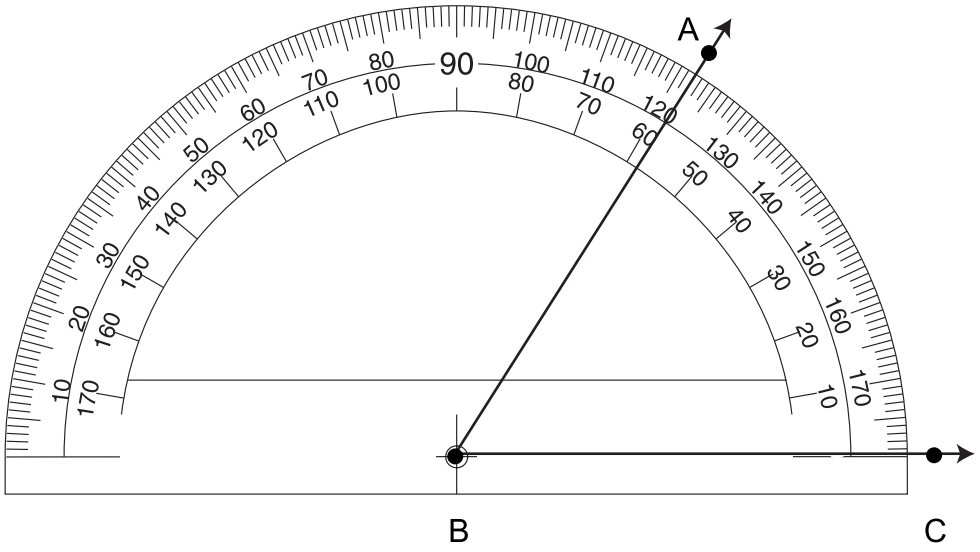
A. 2.0%

B. 8.3%

* C. 16.6%

D. 24.0%

Use the figure below to answer question 36.



36. Eric used a protractor to measure ∠ABC and found the measure to be 122 degrees. His math teacher told him that an error was made in his measurement. What should be the correct angle measure?

* A. 58°

B. 62°

C. 118°

D. 138°

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37. Which of the following patterns would form a cube when folded along the dotted line?

Figure I

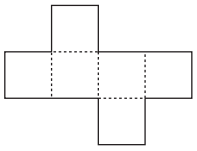


Figure II

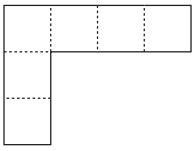


Figure III

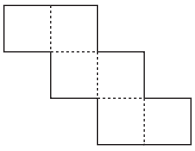
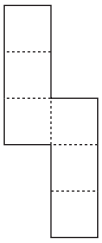


Figure IV



A. I and II

B. III and IV

C. I, II, and III

* D. I, III, and IV

38. Amber is making a pictograph for the high school newspaper to show the number of students in each grade who are in favor of starting classes earlier and leaving school earlier in the day. She summarized her data below.

Amber's Pictograph Data

Grade	Number of Students in Favor of Changing Class Hours
Seniors	125
Juniors	150
Sophomores	75
Freshmen	25

In creating the pictograph key, the symbol below would **best** represent which number of students?

A. 2

B. 10

* C. 25

D. 50

39. What kind of geometric solid is **most** like a telephone pole?

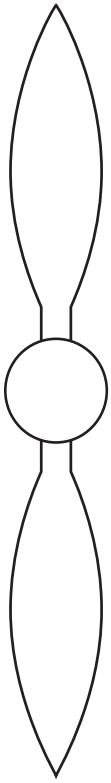
A. cone

B. sphere

* C. cylinder

D. parallelogram

40. The following diagram represents a propeller on an airplane. How many **different** ways can the propeller be divided into two sections and still maintain its symmetry?



A. 1

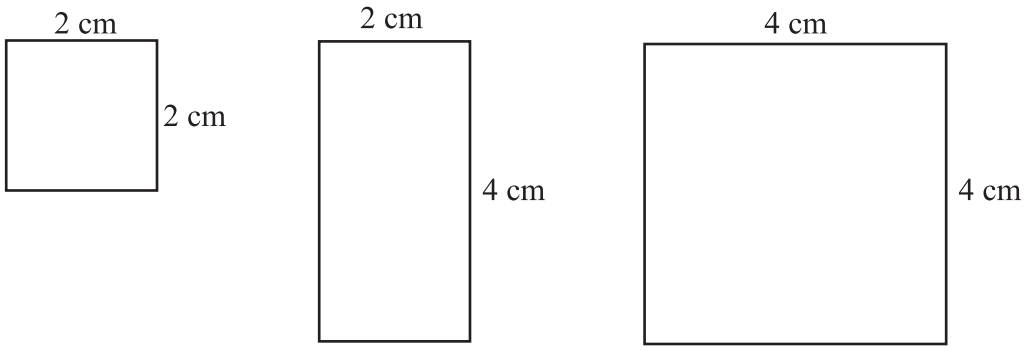
* B. 2

C. 4

D. 6

PART II Released Mathematics Items

MATHEMATICS OPEN-RESPONSE ITEM A



A. Mary's teacher asked the students to create and describe a 6 cm by 6 cm square using all three shapes above, without overlapping. Each shape can be used any number of times.

1. Is it possible to create the 6 cm by 6 cm square using each of the three shapes shown above only one time? Explain your reasoning.

2. How many of each type of shape provided by the teacher would Mary require to create a 6 cm by 6 cm square using all three shapes at **least** once?

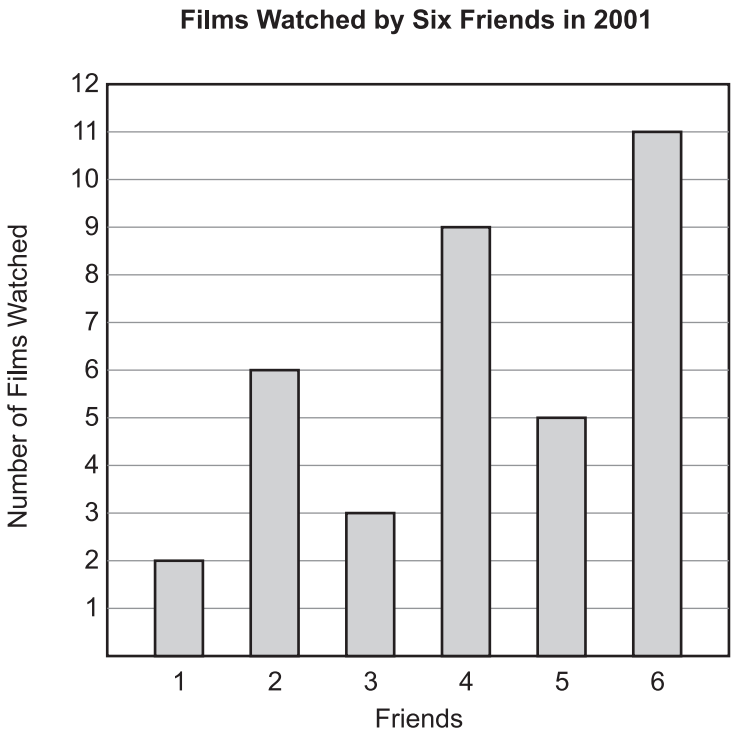
3. Draw the shapes named in Part 2 in a 6 × 6 square arrangement on the grid provided in your answer document. Label each shape's dimensions.

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 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.
0	No understanding is shown.
B	Blank – No Response. A score of "B" will be reported as "NA" (No Attempt – Zero Score).

MATHEMATICS OPEN-RESPONSE ITEM C



C. The graph above shows the number of films watched by 6 seventh-grade friends in a movie theater during the year 2001.

1. What is the mean number of films watched by these 6 friends? Show all your work or explain your answer.

2. Is it reasonable to conclude that this is the mean number of films watched in 2001 by all students at the middle school attended by these 6 friends? Explain your reasoning.

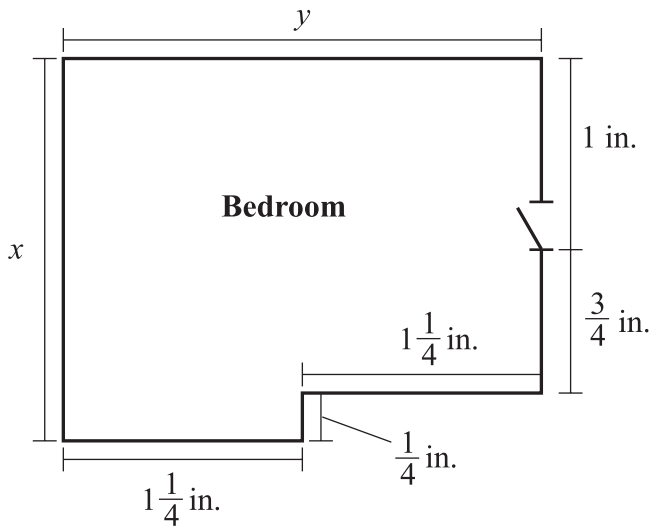
3. Give at least one factor that would provide a more accurate method for finding the mean of the films watched in 2001 by all the students at this middle school. Explain your reasoning.

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM C

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.
0	No understanding is shown.
B	Blank – No Response. A score of "B" will be reported as "NA" (No Attempt – Zero Score).

MATHEMATICS OPEN-RESPONSE ITEM D



Scale: $\frac{1}{4}$ in. = 1 ft

D. The figure above is the scale drawing of a bedroom in which two of the dimensions, x and y, are missing.

1. Using your ruler, measure the length of wall x in inches, and then determine the actual length in feet of this wall. Show all your work or explain your answer.

2. If the actual length of wall y is 10 feet, what is the length of this wall in inches according to the scale? Show all your work or 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.
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

E. Suppose that a company offers to mail any package weighing, at most, 2 pounds to any place in the United States in 2 days or less, for a price that depends on distance. The company charges a $5.00 handling fee plus $0.01 for each mile that the package is carried.

1. What is the total charge for mailing a package under 2 pounds a distance of 100 miles?

2. Create a formula for, or describe in words, the total charge for mailing the package *x* miles.

3. What are the mathematical advantages of displaying the data in each of the following ways?

   I. a table

   II. a graph

   III. a formula

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

RUBRIC FOR MATHEMATICS OPEN-RESPONSE ITEM E

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.
0	No understanding is shown.
B	Blank – No Response. A score of "B" will be reported as "NA" (No Attempt – Zero Score).

PART IV Item Correlation with Curriculum Frameworks

Released Items for Mathematics*

Strands	Content Standards
1—NUMBER SENSE, PROPERTIES, & OPERATIONS (NPO)	1. The student will communicate an understanding of the properties of numbers and operations (add, subtract, multiply, and divide). 2. The student will demonstrate and apply knowledge of numbers and numerical relationships to real-world situations.
2—GEOMETRY & SPATIAL SENSE (GS)	1. The student will demonstrate, construct, communicate, and apply the properties of geometric shapes and spatial sense to connect geometry with problem-solving situations. 2. The student will solve problems that connect geometric applications to other topics in mathematics and other fields.
3—MEASUREMENT (M)	1. The student will use measurement attributes (length, capacity, weight, mass, area, volume, time, money, temperature, scale, and angle) to describe and compare mathematical and real-world objects. 2. The student will demonstrate the appropriate use of measuring instruments. 3. The student will apply measurement concepts to solve problems inside and outside the field of mathematics.
4—DATA ANALYSIS, STATISTICS, & PROBABILITY (DSP)	1. The student will perform the steps that comprise data analysis, from gathering information to communicating results. 2. The student will use probability models to perform experiments and simulations. 3. The student will apply probability and statistical concepts in problem-solving and decision-making situations.
5—PATTERNS, ALGEBRA, & FUNCTIONS (PAF)	1. The student will use the language/symbols of algebra to represent patterns and functions. 2. The student will use algebraic concepts to model, to solve, and to test solutions of mathematical and real-world problems.

Item	Strand	Content Standard	Student Learning Expectation
1	NPO	2	2
2	DSP	3	1
3	DSP	1	1
4	PAF	2	2
5	M	3	3
6	PAF	2	2
7	GS	1	1
8	NPO	2	2
9	DSP	1	3
10	GS	1	1
11	NPO	1	1
12	M	1	2
13	PAF	1	2
14	DSP	1	1
15	DSP	1	1
16	NPO	1	1
17	M	2	1
18	GS	1	1
19	M	1	1
20	PAF	1	1
21	GS	1	4
22	M	3	1
23	DSP	2	3

Item	Strand	Content Standard	Student Learning Expectation
24	NPO	1	2
25	DSP	3	3
26	M	2	1
27	GS	2	1
28	NPO	1	2
29	PAF	1	4
30	DSP	3	3
31	M	3	3
32	NPO	2	4
33	PAF	2	3
34	PAF	1	3
35	NPO	2	2
36	M	2	1
37	GS	1	5
38	PAF	2	2
39	GS	2	2
40	GS	2	2
A	GS	1	1
B	NPO	2	2
C	DSP	1	3
D	M	3	3
E	PAF	2	4

*Only the predominant Strand, Content Standard, and Student Learning Expectation is listed for the Mathematics and English Language Arts items.