



**NEW ENGLAND  
COMMON ASSESSMENT PROGRAM**

**Released Items  
2010**

**Grade 7  
Mathematics**

# Mathematics



Items with this symbol were selected from Session One—no calculators or other mathematics tools allowed.



1 Which expression below is equivalent to  $3^2 \times 3^4$ ?

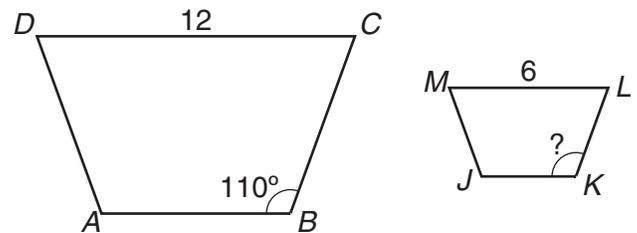
- A.  $3^6$
- B.  $3^8$
- C.  $9^6$
- D.  $9^8$

2 Which triangle is **not** possible to construct?

- A. a right isosceles triangle
- B. an acute equilateral triangle
- C. an obtuse scalene triangle
- D. a right equilateral triangle



3 Look at this diagram.



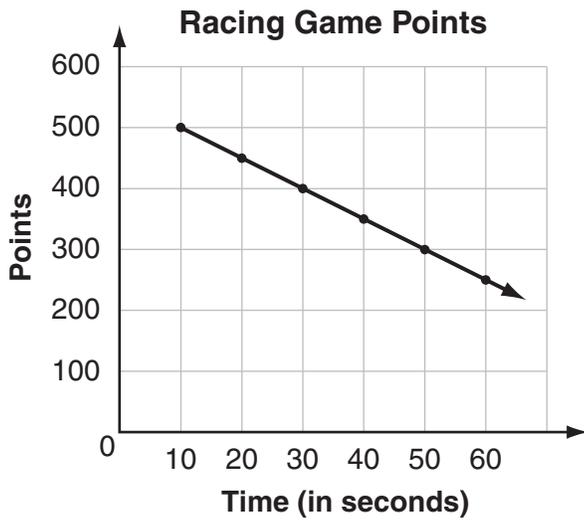
Trapezoid  $ABCD$  is similar to trapezoid  $JKLM$ . What is the measure of  $\angle K$ ?

- A.  $55^\circ$
- B.  $70^\circ$
- C.  $110^\circ$
- D.  $140^\circ$

4 Henry rode his bike around a circular track. One time around the track is about 300 feet. About how far is it from one side of the track through the center to the other side?

- A. 50 feet
- B. 100 feet
- C. 600 feet
- D. 900 feet

- 5 Wendy is playing a racing game. This graph shows the relationship between the time it takes Wendy to finish a race and the number of points she earns.



Based on this graph, how many points does Wendy earn when she finishes a race in 80 seconds?

- A. 250
- B. 200
- C. 150
- D. 100

- 6 Look at this table.

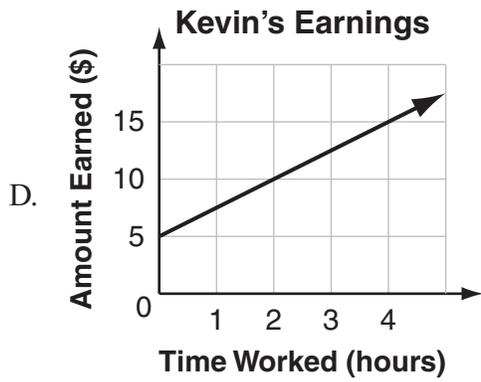
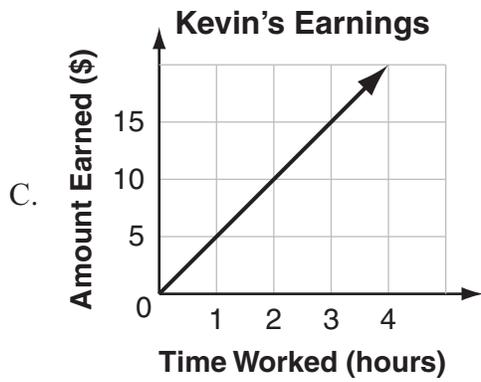
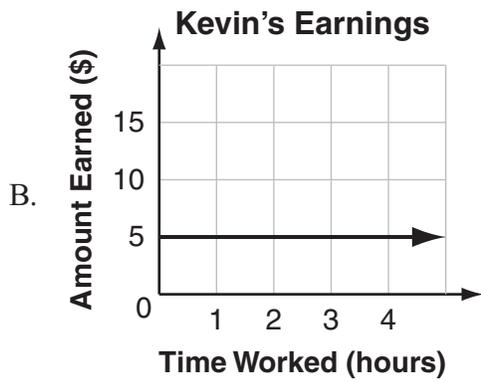
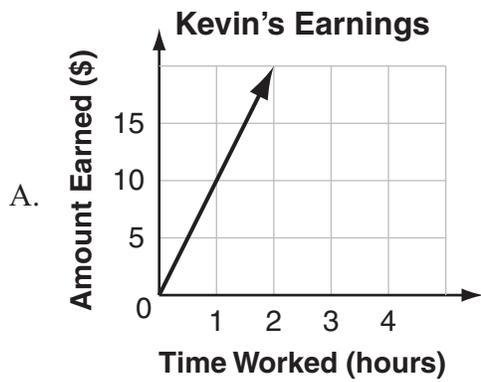
**Client Charges**

Client	Hours	Charge
Angie	2.0	\$40.00
Dave	1.5	\$32.50
Frank	3.0	\$55.00
Carrie	0.5	\$17.50
Deb	2.5	\$47.50

Yoshi is a personal trainer. The table shows how much he charges his clients. Yoshi has two new clients, Wayne and Emily. He worked with Wayne one more hour than he did with Emily. How much more money did Yoshi charge Wayne than he charged Emily?

- A. \$15.00
- B. \$20.00
- C. \$25.00
- D. \$35.00

- 7 Kevin earns \$5 per hour working at an ice rink. Which graph best represents Kevin's total earnings over time?



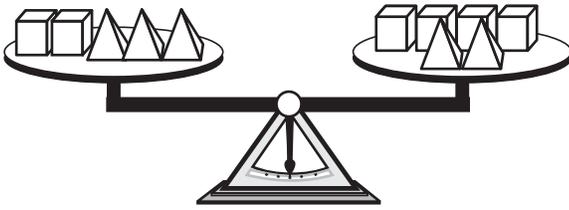
- 8 Look at this equation.

$$w = \frac{2}{3}t + 6$$

What is the value of  $w$  when  $t = 12$ ?

- A. 24
- B. 14
- C. 12
- D. 9

- 9 This scale is balanced.



Let  $c$  be the weight of one cube and  $p$  be the weight of one pyramid. Based on the scale, which equation represents the relationship between  $c$  and  $p$ ?

- A.  $5c = 6p$
- B.  $5p = 6c$
- C.  $c = 2p$
- D.  $p = 2c$

- 10 Each member of a computer club picks a password that is three characters long.
- The first character in each password is a vowel (A, E, I, O, U).
  - The second and third characters are digits from 1 through 3.
  - A digit can be repeated.

How many different passwords are possible?

- A. 8
- B. 15
- C. 30
- D. 45



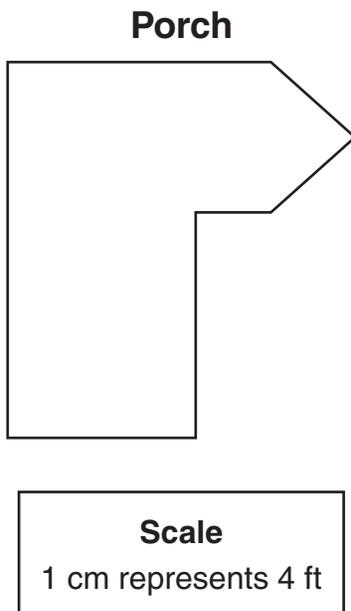
- 11 The temperature at 4:00 P.M. was  $-6$  degrees Celsius. By 10:00 P.M., the temperature had decreased by 5 degrees Celsius. What was the temperature at 10:00 P.M.?

- 12 The equation below shows the relationship among the number of faces,  $f$ , the number of vertices,  $v$ , and the number of edges,  $e$ , of any prism.

$$f + v = 2 + e$$

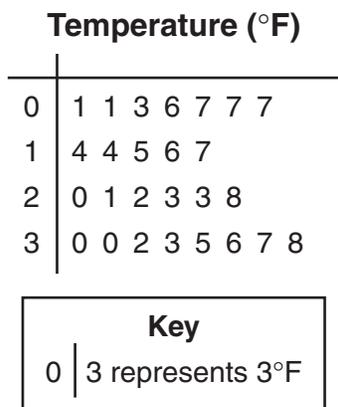
A prism has 6 faces and 12 edges. How many vertices does the prism have?

- 13 Look at this scale drawing of a porch.



Use a ruler to answer this question. What is the perimeter, in feet, of the porch? Show your work or explain how you know.

- 14 This stem-and-leaf plot shows the temperature at 6 A.M. for 26 days of one month.



- a. What is the mode of this data set?
- b. When data for the last four days of the month are included in the set, the mode decreases but the median does not change. List a set of four temperatures that could give this result.
- 15 Jana uses 20 cards to play a memory game. The cards are either animal cards or fruit cards. The ratio of animal cards to fruit cards is 2:3.
- a. Draw a model to show the ratio of animal cards to fruit cards. Use the letter  $A$  to represent animal cards and the letter  $F$  to represent fruit cards.
- b. How many of the 20 cards are animal cards?
- c. Of the fruit cards,  $\frac{1}{3}$  have bananas on them. How many cards have bananas on them? Show your work or explain how you know.