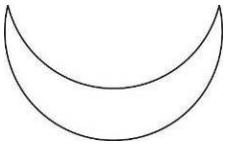
Mathematics Samples

Grade: 4
State: Montana

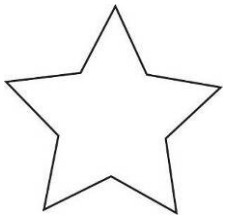
Standard: Students demonstrate an understanding of symmetry and transformations Identifying a symmetric figure and determining all of its lines of symmetry

Which of the following pictures has **no** line of symmetry?

A 

B 

C 

D 

Distractor Rationale:
A. The picture has only one line of symmetry.
B. The picture has only one line of symmetry.
C. Key
D. The picture has more than one line of symmetry.

Grade: 9-12
State: NA

SCANTRON

Standard: Interpreting Categorical and Quantitative

Beth placed the eight tiles below into a bag.

If she randomly draws tiles from the bag without replacement, what is the probability she will draw them out in alphabetical order?

A. $\frac{1}{64}$

B. $\frac{315}{131072}$

C.* $\frac{1}{40320}$

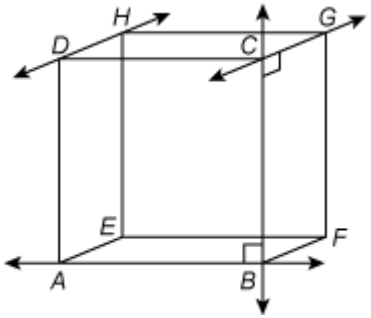
D. $\frac{1}{16777216}$

Grade: 9-12
State: NA

SCANTRON

Standard: Congruence

Which pair of lines is parallel on the cube pictured below?



A. 6 and 7

B. 6 and 8

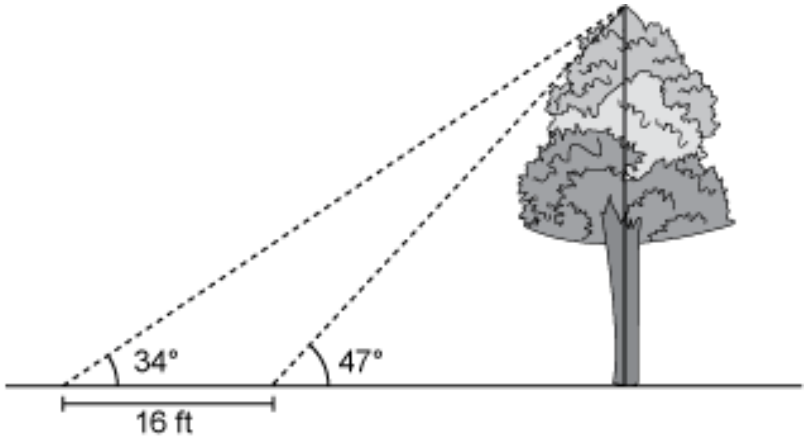
C. 6 and 9

D.* 8 and 9

Grade: 9-12
State: NA

Standard: Similarity, Right Triangles, and Trigonometry

Peter measured the height of a tree by finding the angle of elevation to the top of the tree from two different locations, 16 feet apart.



What is the approximate height of the tree?

A. 10.8 feet
B. 27.1 feet
C.* 29.1 feet
D. 43.1 feet

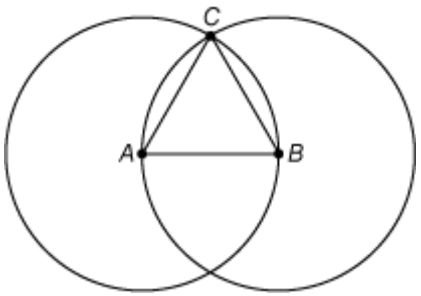
Grade: 9-12
State: NA

SCANTRON

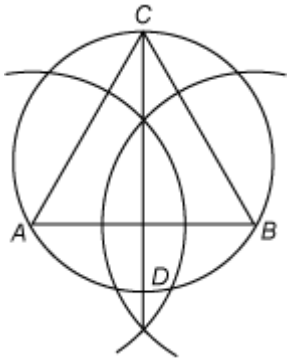
Standard: Congruence

Which of the following shows a completed construction of an equilateral triangle inscribed in a circle?

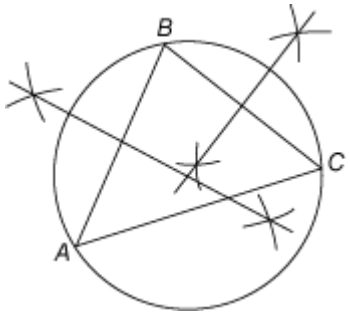
A.



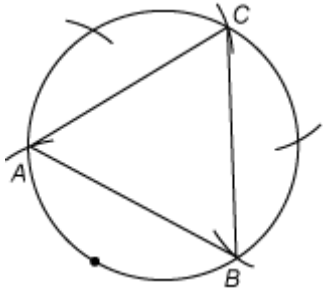
B.



C.



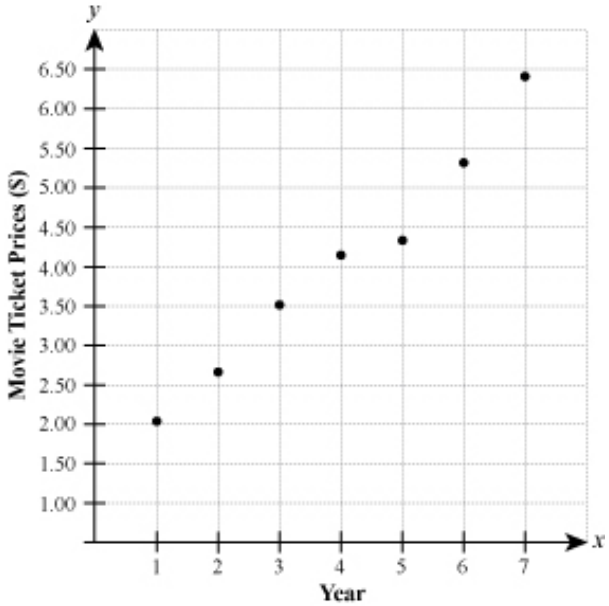
D.*



Grade: High School
State: Algebra EOC North Carolina

Standard: Create linear models for sets of data to solve problems. a) Interpret constants and coefficients in the context of the data. b) Check the model for goodness-of-fit and use the model, where appropriate, to draw conclusions or make predictions.

An economics student studied the increase in prices of movie tickets over a few years. The scatter plot below shows the average price of an adult ticket for seven years.



What average ticket price can be predicted for year 8 from the data in the scatter plot?

A. $6.90

B.* $7.70

C. $8.30

D. $9.00

Grade: High School
State: EOC North Carolina

Standard: Use formulas and algebraic expressions, including iterative and recursive forms, to model and solve problems.

The period, *P*, of a pendulum's swing and length of the pendulum, *l*, are given by $P = 2\pi\sqrt{\frac{l}{g}}$ where *g* is acceleration due to gravity which is a constant.

If the length of the pendulum is increased four times, what will happen to the period?

A. The period will halve.
B.* The period will double.
C. The period will remain constant.
D. The period will increase four times.

Grade: 9-12
State: NA

SCANTRON

Standard: Congruence (Constructed Response Item)

Points $P(3, 2)$, $Q(3, 5)$, and $R(7, 2)$ are plotted on the coordinate plane and mapped onto P', Q', and R' by the reflection $(x,y) \rightarrow (-x,y)$

A. What are the lengths of [ ], [ ], and [ ]?

B. How are [1] and [2] related?

C. What type of triangle is [ ]?

D. What are the coordinates of P', Q', and R'?

E. What are the side lengths of [ ]?

F. What type of triangle is [5] ?

Scoring Instructions:
This question is scored on a FOUR point rubric. (6 Points) = 4 RUBRIC POINTS; (4-5 Points) = 3 RUBRIC POINTS; (2-3 Points) = 2 RUBRIC POINTS; (0-1 Point) = 1 RUBRIC POINT;

Answers: Part A - 1 point total for getting all three lengths correct; 3, 4, and 5. Part B - 1 point for perpendicular. Part C - 1 point for right triangle. Part D - 1 points total for getting all three coordinates correct $P'(-3, 2)$, $Q'(-3, 5)$, $R'(-7, 2)$. Part E - 1 point total for getting all three lengths correct; 3, 4, and 5. Part F - 1 point for right triangle.