

2008 Achievement Test Released Items

The items presented in this document are from the previously secured 2008 Grade 9 Mathematics Achievement Test. These items are released by Alberta Education for teacher and student use.

Grade 9 Mathematics Achievement Test Released Items

2008

01. Item not released.

Use the following information to answer numerical-response question 1.

The following expressions are examples of powers.

$(2)^{-2}$

1

$-(2)^2$

2

$(-2)^2$

3

$-(-2)^2$

4

Numerical Response

- 1.** Listed in order of **increasing** value, the expressions numbered above are _____, _____, _____, and _____.

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

Items 2 and 3 not released.

- 4.** What is the value of x in the equation $(2a^{-3})(6a^x) = 12a^{15}$?
- A. -18
 - B. -12
 - C. 12
 - D. 18
- 5.** The estimated mass of one of the smallest living organisms is 1.0×10^{-16} g. How many of these organisms are needed to have a total mass of 1 g?
- A. 1×10^{16}
 - B. 1×10^{15}
 - C. 1×10^{-15}
 - D. 1×10^{-16}

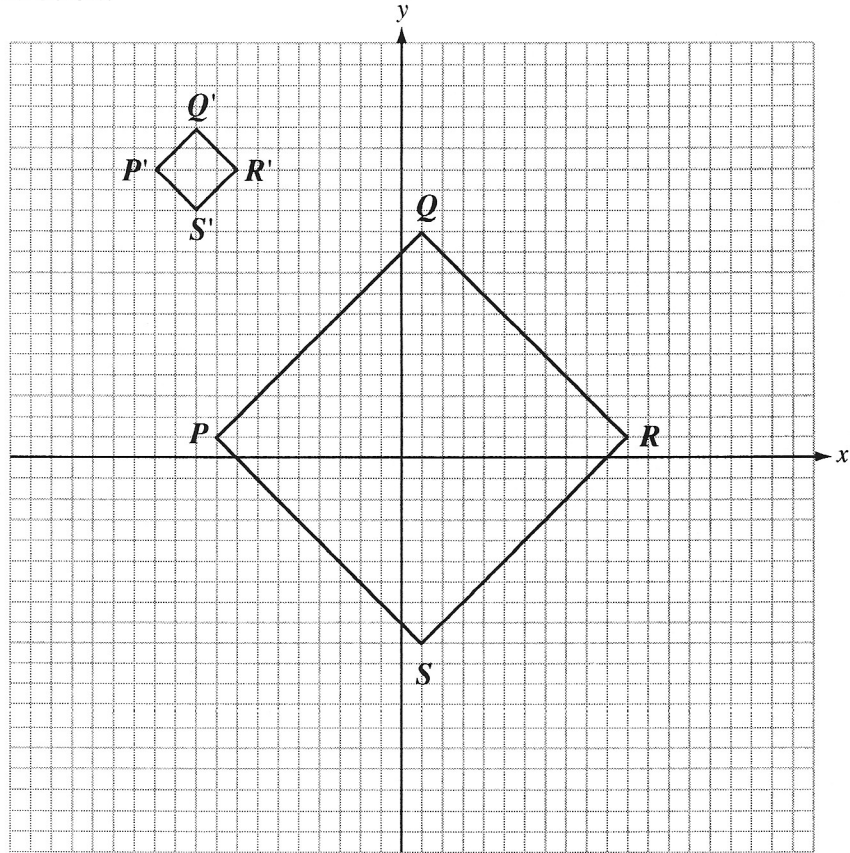
Use the following information to answer question 6.

The perimeter of a triangle is $24x - 6$. The lengths of two sides of the triangle are represented by the expressions $5x - 7$ and $2x + 5$.

6. Which of the following expressions represents the length of the third side of the triangle?
- A. $17x + 8$
 - B. $17x - 8$
 - C. $17x + 4$
 - D. $17x - 4$
-
7. Ross conducts a survey to determine the demand for a skateboard park. Ross can **best** minimize the bias in his survey by surveying people
- A. at only one location
 - B. who have skateboards
 - C. who are different ages
 - D. at the same time of day

Use the following information to answer question 8.

The square PQRS has been dilated to form the square P'Q'R'S', as shown on the grid below.



8. What is the scale factor of the dilatation shown above?

- A. $\frac{1}{6}$
- B. $\frac{1}{5}$
- C. 5
- D. 6

9. Item not released.

Numerical Response

2. Item not released.

10. Which of the following calculator keystroke sequences would give the solution to $\frac{33+9}{6 \times (5-2)}$?

A. 33 $+$ 9 \div 6 \times 5 $-$ 2 $=$

B. (33 $+$ 9) \div 6 \times (5 $-$ 2) $=$

C. 33 $+$ 9 \div (6 \times (5 $-$ 2)) $=$

D. ((33 $+$ 9) \div (6 \times (5 $-$ 2))) $=$

11. Item not released.

Use the following information to answer question 12.

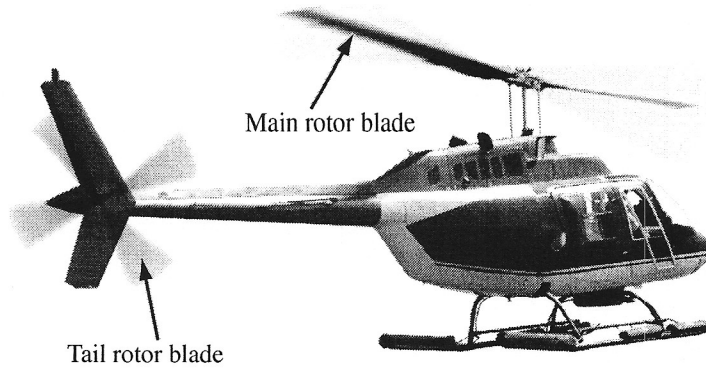
Cailey earns \$15 an hour and her monthly expenses are \$1 150.

12. Which of the following inequalities can be used to determine the number of hours, t , that Cailey must work in one month to save at least \$200?

- A. $15t + 1\,150 \geq 200$
- B. $15t + 1\,150 \leq 200$
- C. $15t - 1\,150 \geq 200$
- D. $15t - 1\,150 \leq 200$

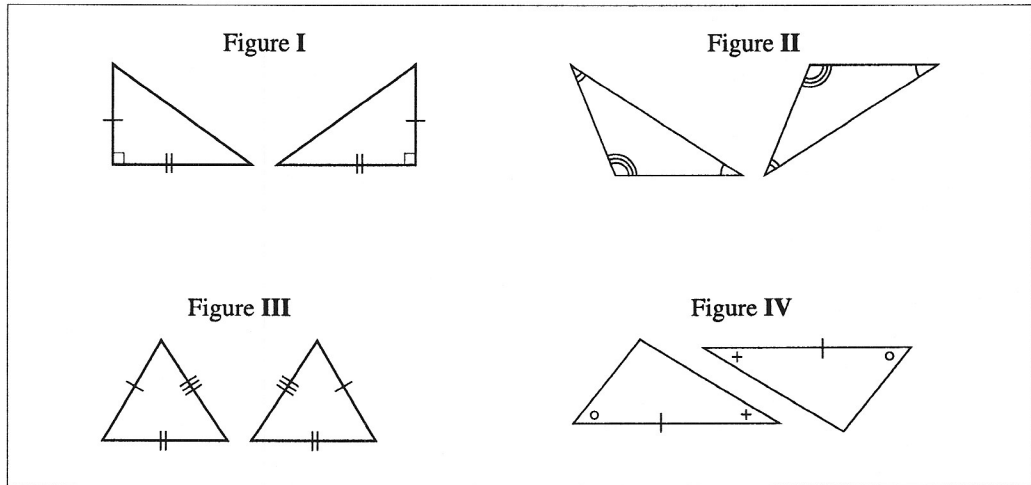
Use the following information to answer question 13.

The tail rotor blade of the helicopter shown below rotates 4 times for every 1 main rotor blade rotation.



13. How many times will the helicopter's main rotor blade rotate if its tail rotor blade rotates 600 000 000 times?
- A. 1.5×10^8
 - B. 1.5×10^9
 - C. 2.4×10^8
 - D. 2.4×10^9

Use the following information to answer question 14.



14. Which figure does **not** prove congruency?

- A. I
- B. II
- C. III
- D. IV

15. Francis has an equal number of nickels, dimes, and quarters. If she has \$4.40 in coins, then the total number of nickels that she has is

- A. 33
- B. 30
- C. 11
- D. 10

Items 16 to 18 not released.

Use the following information to answer question 19.

A student completed the following four steps to solve the equation $\frac{x}{40} + \frac{x}{60} = 1$. However, in one of the steps the student makes a mistake.

Step 1 $120\left(\frac{x}{40} + \frac{x}{60}\right) = 1$

Step 2 $\frac{120x}{40} + \frac{120x}{60} = 1$

Step 3 $3x + 2x = 1$

Step 4 $5x = 1$

Solution $x = \frac{1}{5}$

19. In which step was the mistake made in solving the equation?

- A. Step 1
- B. Step 2
- C. Step 3
- D. Step 4

20. What is the value of the expression $2x^2 - 3x + 2x - 3$ if $x = 8$?

- A. 53
- B. 85
- C. 101
- D. 117

21. If the expression $-3x + 5 + x - 8 + 5x - 7$ is simplified, which of the following rows identifies the coefficient and the constant?

Row	Coefficient	Constant
A.	3	10
B.	3	-10
C.	-3	10
D.	-3	-10




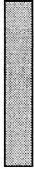
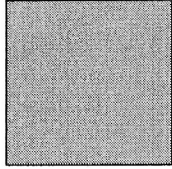
Numerical Response

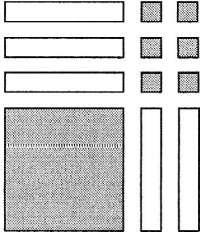
3. Cailey is training for a race. Each day she runs 2 km more than she did the previous day. If Cailey ran a total of 21 km in 3 days, then how many kilometres did she run on the first day?

Answer: _____ kilometres

(Record your answer in the numerical-response section on the answer sheet.)

Use the following algebra-tile legend and algebra-tile model to answer question 22.

<p>LEGEND:</p> <p> Shaded is positive</p> <p> Unshaded is negative</p>	 = 1  = x  = x^2
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<p>MODEL:</p>	
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22. A factorization of the trinomial represented by the algebra-tile model above is
- A. $(x - 2)(x - 3)$
 - B. $(x + 3)(x + 2)$
 - C. $(x + 6)(x - 1)$
 - D. $(x - 1)(x - 6)$

23. **Item not released.**

Use the following information to answer question 24.

Two friends spent a total of $3\frac{1}{2}$ hours at various places in a mall as shown below.

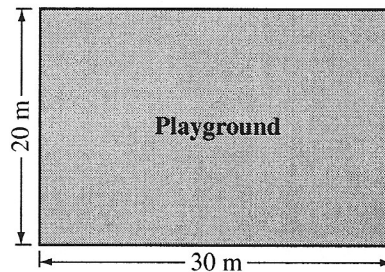
Food court	25% of the time
Movie theatre	43% of the time
Shops	29% of the time
Other	3% of the time

24. How many minutes did they spend in the food court?
- A. 11.4 min
 - B. 28.5 min
 - C. 52.5 min
 - D. 81.3 min
-

Items 25 and 26 not released.

Use the following information to answer question 27.

A playground is rectangular in shape with dimensions as shown in the diagram below.



27. By how many metres must both dimensions of the playground be increased in order to double the area of the playground?
- A. 10 m
 - B. 20 m
 - C. 50 m
 - D. 100 m

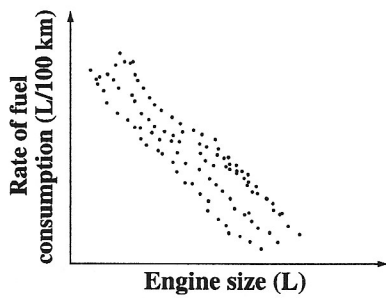
Numerical Response

4. Item not released.

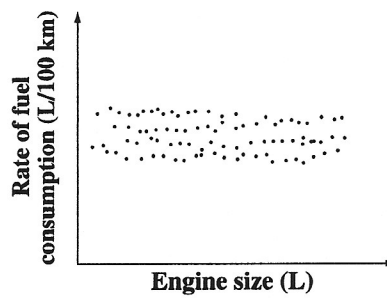
Items 28 and 29 not released.

30. Which of the following scatter plots **best** shows that at a constant speed, automobiles with smaller engines are more likely to have better fuel economy?

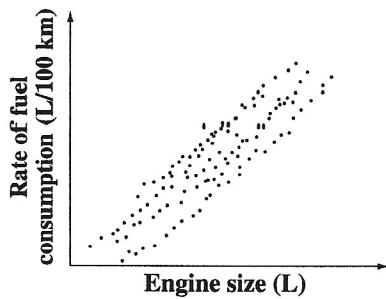
A.



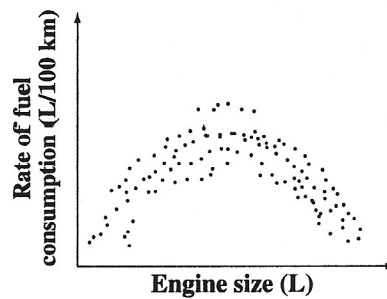
B.



C.

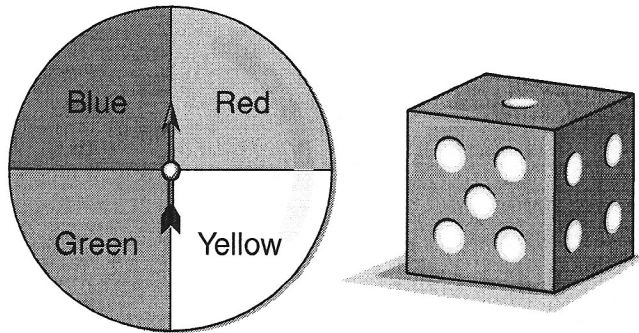


D.



Use the following information to answer question 31.

A spinner and a 6-sided number cube are shown below.



31. What is the probability of spinning the colour red and then rolling a 1 or 2?

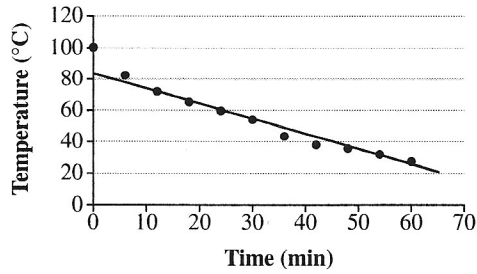
- A. $\frac{1}{24}$
- B. $\frac{1}{12}$
- C. $\frac{1}{8}$
- D. $\frac{1}{6}$

Use the following information to answer question 32.

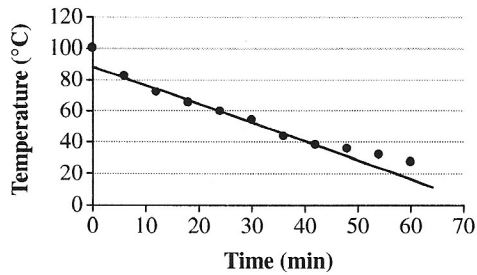
The temperature of a solution was taken over a 60-minute period. The results were graphed on a scatter plot.

32. Which of the following scatter plots shows the line of best fit for the temperatures of the solution over the 60-minute period?

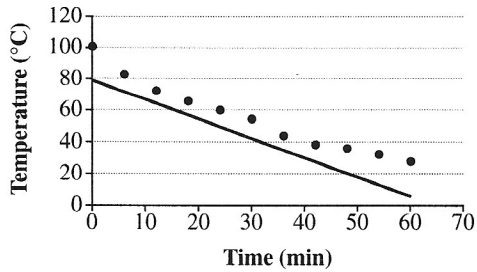
A.



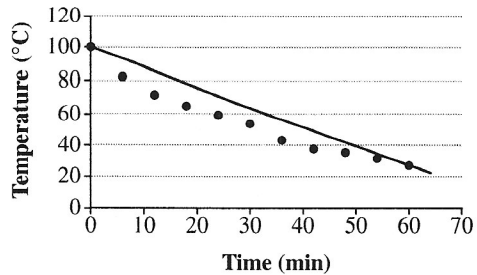
B.



C.

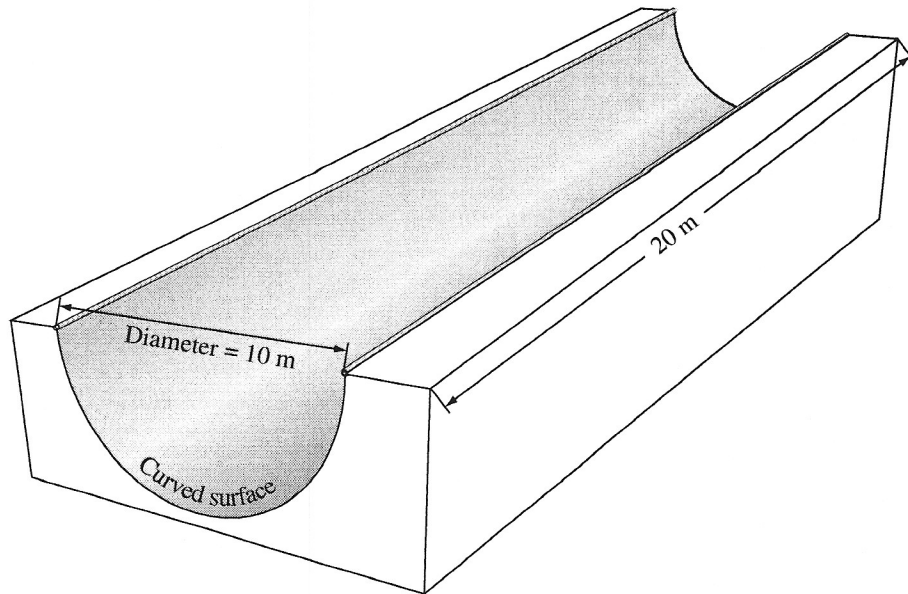


D.



Use the following information to answer question 33.

A “half-pipe” such as those used by skateboarders is shown below.



Circumference of a circle = πd

33. What is the area of the curved surface of the half-pipe, to the nearest metre?

- A. 157 m^2
- B. 200 m^2
- C. 314 m^2
- D. 628 m^2

Use the following expression to answer question 34.




$$\frac{(2^3 \times 2^4)^2}{(2^2 \times 4^3)}$$

34. Which of the following powers is equivalent to the expression above?

- A. 2^6
- B. 2^9
- C. 4^{16}
- D. 4^{18}

Use the following information to answer numerical-response question 5.

A student performs an experiment by throwing a paper cup into the air and observing how it lands. A tally chart of the results is shown below.

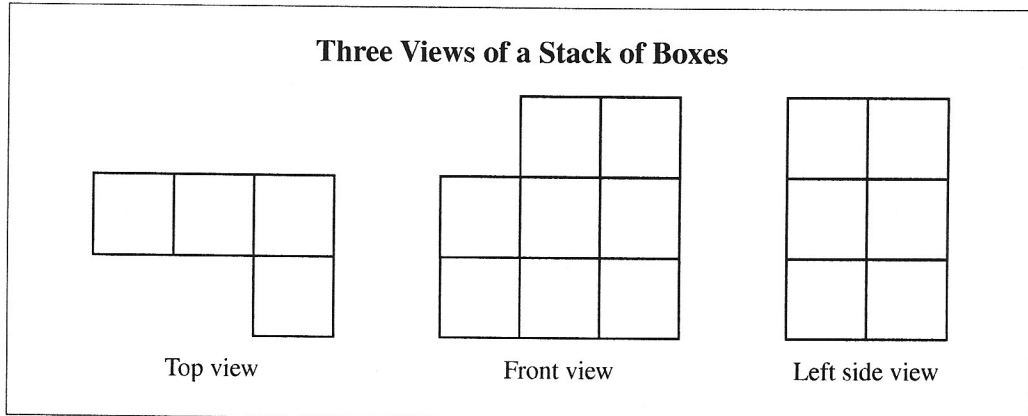
Possible Outcome	Number of Outcomes
Cup lands on its side 	
Cup lands upright 	
Cup lands upside down 	

Numerical Response

5. According to the tally chart above, the probability of the cup **not** landing on its side, expressed as a percentage, is _____ %.

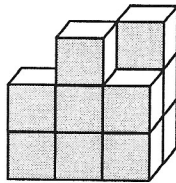
(Record your answer in the numerical-response section on the answer sheet.)

Use the following diagram to answer question 35.



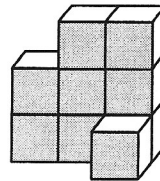
35. Which of the following stacks of boxes represents the three views shown above?

A.



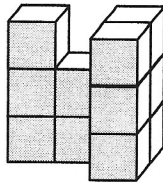
Front view

B.



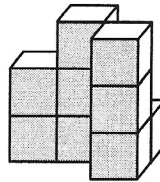
Front view

C.



Front view

D.



Front view

36. If $x = 90$, then which of the following expressions is a rational number?

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

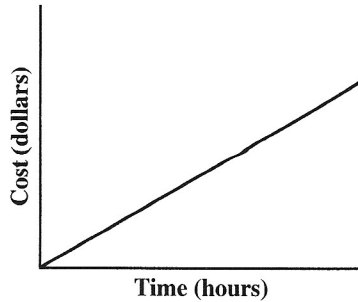
B. \sqrt{x}

C. πx

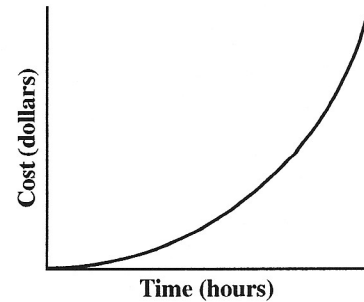
D. $\tan x^\circ$

37. Movers from a particular moving company charge \$46.00/hr. Which of the following graphs represents the relationship between the number of hours that the movers work and the total cost of a move?

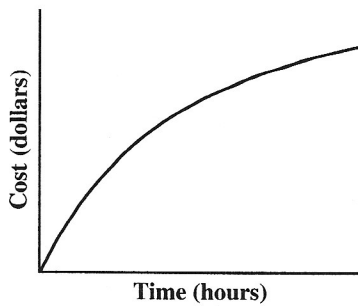
A.



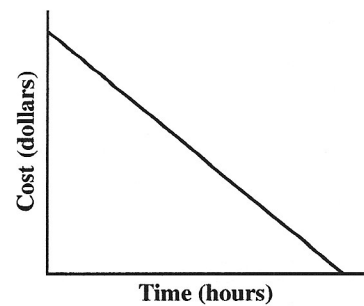
B.



C.



D.



Items 38 to 42 not released.

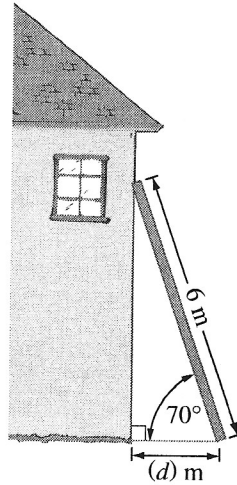
Numerical Response

6. Sidney wants to build a rectangular ice rink in her backyard. If she wants the ice rink to have the **greatest** possible area within a perimeter of 36 m, then she should make the length of one side of the ice rink _____ m.

(Record your answer in the numerical-response section on the answer sheet.)

Use the following information to answer question 43.

A 6 m ladder leans against a vertical wall of a house at an angle of 70° , as shown below.



43. Which of the following trigonometric ratios can be used to calculate the distance, d , from the house to the base of the ladder?

A. $\cos 70^\circ = \frac{d}{6}$

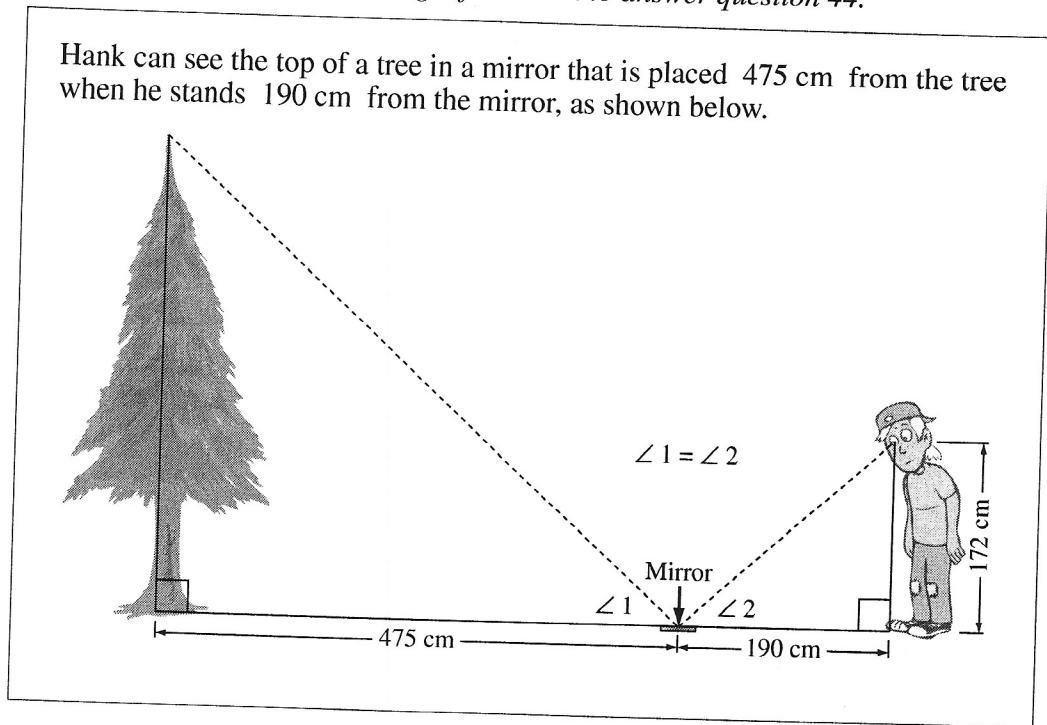
B. $\cos 70^\circ = \frac{6}{d}$

C. $\sin 70^\circ = \frac{d}{6}$

D. $\sin 70^\circ = \frac{6}{d}$

Use the following information to answer question 44.

Hank can see the top of a tree in a mirror that is placed 475 cm from the tree when he stands 190 cm from the mirror, as shown below.



44. What is the height of the tree shown above?

- A. 256 cm
- B. 362 cm
- C. 430 cm
- D. 525 cm