

Advanced Triangle Applications

Foundation to Challenge

Practice should make the test feel easier, not merely familiar.

Work without the answer key first. Check answers through the SAT Practice Library after completing the set.

ADVANCED

- 1 An equilateral triangle AED lies inside square ABCD with A and D as adjacent vertices. What is $\angle BEC$?

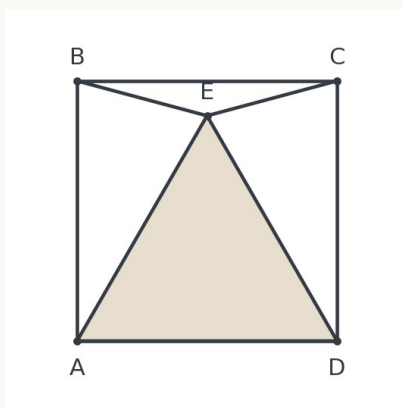


Diagram not drawn to scale.

- A. 90°
- B. 150°
- C. 120°
- D. 135°

- 2 A semicircle of radius 4 sits on top of a square of side 8. A is the top of the semicircle and B is the lower-right corner of the square. What is AB ?

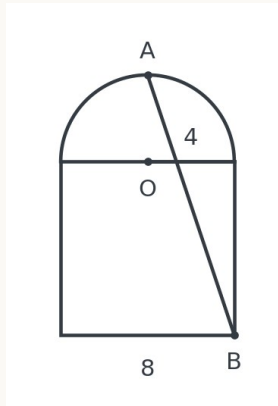


Diagram not drawn to scale.

- A. $4\sqrt{5}$
- B. $4\sqrt{10}$
- C. $8\sqrt{2}$
- D. 12

CHALLENGE

- 3 Equilateral triangle DEF is inscribed in equilateral triangle ABC , with D on AB , E on AC , and F on BC . ED is perpendicular to AC . What is $\text{area}(DEF):\text{area}(ABC)$?

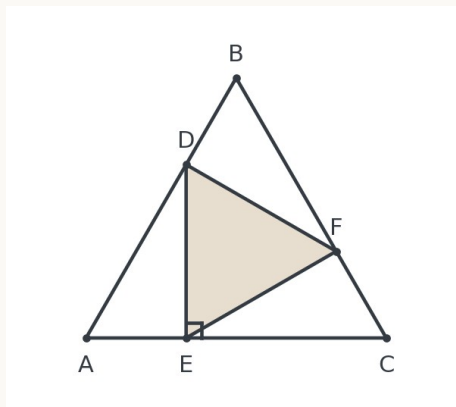
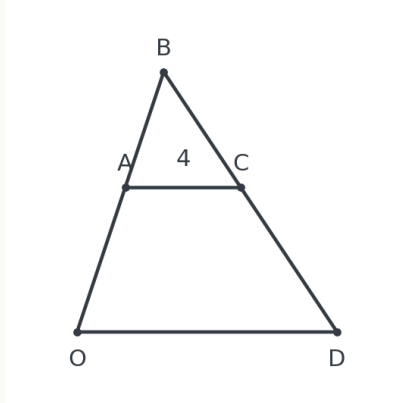


Diagram not drawn to scale.

- A. 1:4
- B. 1:3
- C. 1:2
- D. 5:8

ADVANCED

- 4 In triangle OBD , $O = (0, 0)$, $B = (3, 9)$, $D = (9, 0)$. A lies on OB and C on BD so AC is horizontal of length 4. What is BC ?



AC is horizontal. Diagram not drawn to scale.

FOUNDATION

- 5 In triangle ABC , $AB = BC = 10$ and $\angle ABC = 120^\circ$. What is its area?

CHALLENGE

- 6 A square has side 10. Point F on BC satisfies $BF=5$. Diagonal DB meets AF at E . What is BE ?

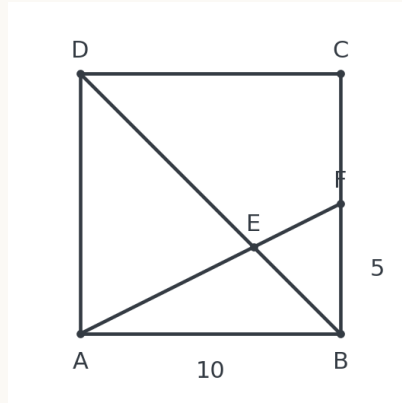
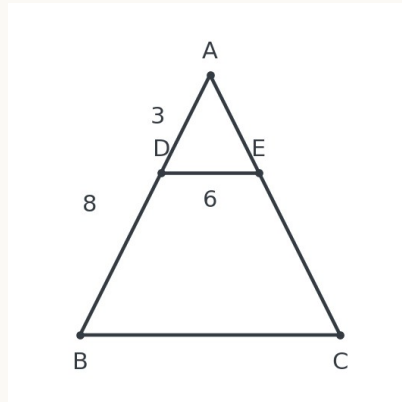


Diagram not drawn to scale.

- A. $10\sqrt{2}/3$
- B. $5\sqrt{2}/2$
- C. $3\sqrt{2}$
- D. 4

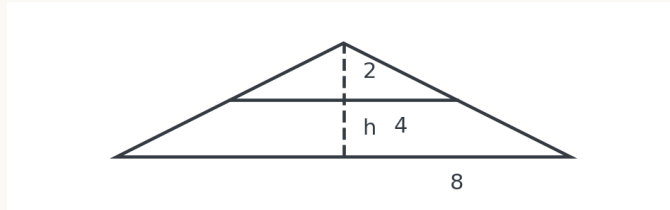
- 7 In triangle ABC , D lies on AB and E lies on AC with $DE \parallel BC$. If $AD=3$, $AB=8$, and $DE=6$, what is BC ?



$DE \parallel BC$. Diagram not drawn to scale.

FOUNDATION

- 8 A cone has base radius 8. A horizontal slice creates a top cone of height 2 and radius 4. What is the height of the lower frustum?



Axial cross-section of the cone; h is the frustum height.

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

STANDARD

- 9 $A = (-3, 6)$, $B = (-3, -2)$, $C = (5, -2)$. What is $\angle BAC$ in radians?

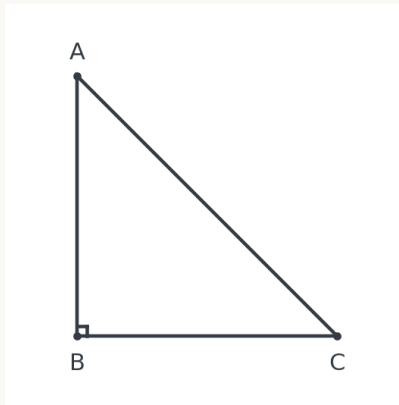


Diagram not drawn to scale.

- A. $\pi/6$
- B. $\pi/4$
- C. $\pi/3$
- D. $\pi/2$

ADVANCED

10

Two parallel lines have slope $-\frac{3}{4}$. One passes through $(0, 5)$. The second line has an x-intercept 12 units to the left of the first line's x-intercept. What is the y-intercept of the second line?

FINISHED?

Check your answers online

aryalanupme.github.io/sat-advanced-triangles.html

Do not stop at “wrong.” Identify why it was wrong: concept, algebra, arithmetic, interpretation, calculator choice, or timing.

I do not correct the answer first. I correct the reason.

Independent SAT-style practice. Not affiliated with or endorsed by College Board.