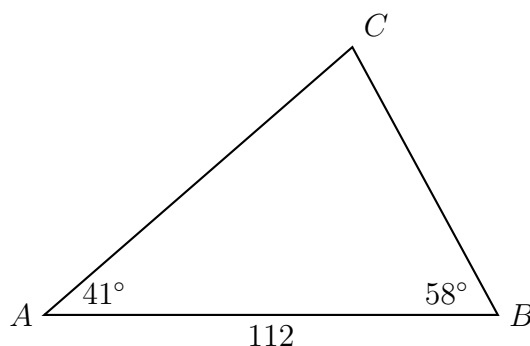


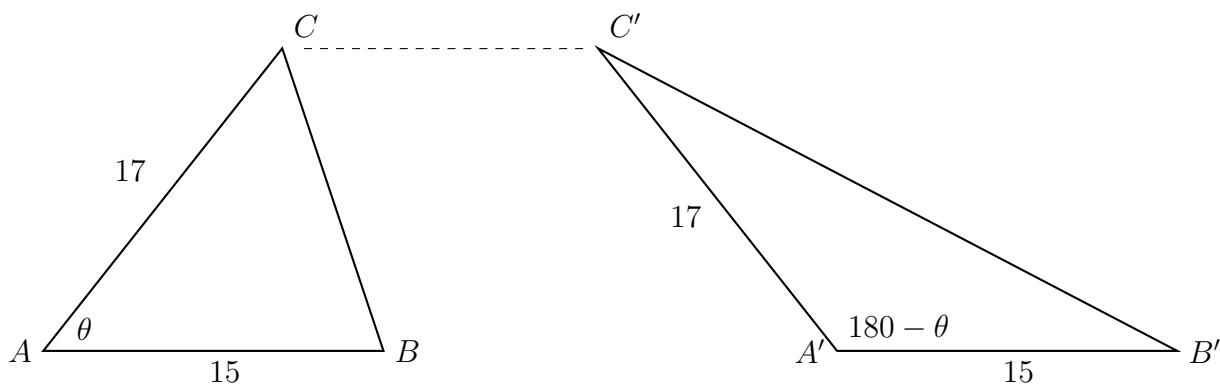
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1. Solve the given triangle (determine the values of all lengths and angles)



2. Find the slant height of a cone with a diameter of 32 centimeters and height of 12 cm.
3. Triangle  $ABC$  has an area of 100, with  $AB = 15$  and  $AC = 17$ . Find the measure of the angle  $A$ .

Hint: Consider that the two configurations shown have the same base and altitude.



4. Express each value as a decimal, first writing the whole calculator display, and then the 3 sig-fig approximation. [4 marks]

(a)  $\frac{2\pi}{3}$

(b)  $\frac{\sqrt{3}}{2}$

5. Express each value as a decimal, rounding to 3 sig-figs if necessary. [3 marks]

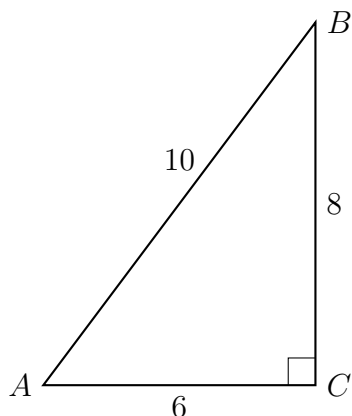
(a)  $4.561 \times 10^4$

(b)  $1.90 \times 10^{-3}$

6. Find the volume of a spherical balloon 36 meters in diameter. [3 marks]

7. A cone has a height of 24 cm and volume of  $220.5\pi \text{ cm}^3$ . Find its radius. [3 marks]

8.  $\triangle ABC$  is shown with  $m\angle C = 90^\circ$  and the lengths of the triangle's sides are  $BC = 8$ ,  $AC = 6$ , and  $AB = 10$ .



(a) Write down the value of  $\sin A$ .  
[1 mark]

(b) Find the measure of  $\angle A$ . [2 marks]

9. In right triangle  $ABC$ , hypotenuse  $\overline{AB}$  has a length of 26 cm, and side  $\overline{BC}$  has a length of 17.6 cm. What is the measure of angle  $B$ ?

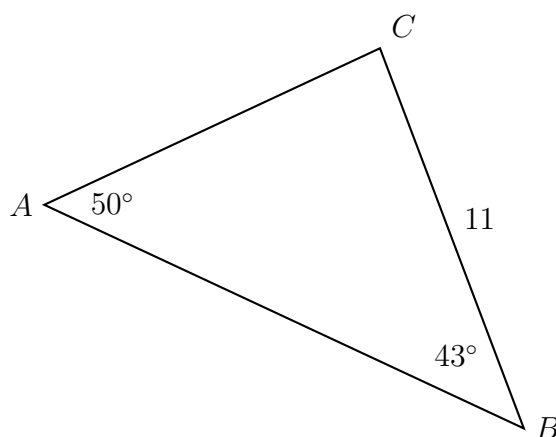
10. Find the slant height of a pyramid with square base 4 meters on a side and height of 4 m. [3 marks]

11. Triangle  $ABC$  has an area of 25, with  $AB = 7$  and  $AC = 8$ .

(a) Find the two possible measures for  $\hat{A}$ . [4 marks]

(b) Given that  $\hat{A}$  is obtuse, find  $BC$ . [3 marks]

12. The following diagram shows triangle  $ABC$  (not drawn to scale).



$BC = 11$ ,  $\hat{C}AB = 50^\circ$ , and  $\hat{A}BC = 43^\circ$

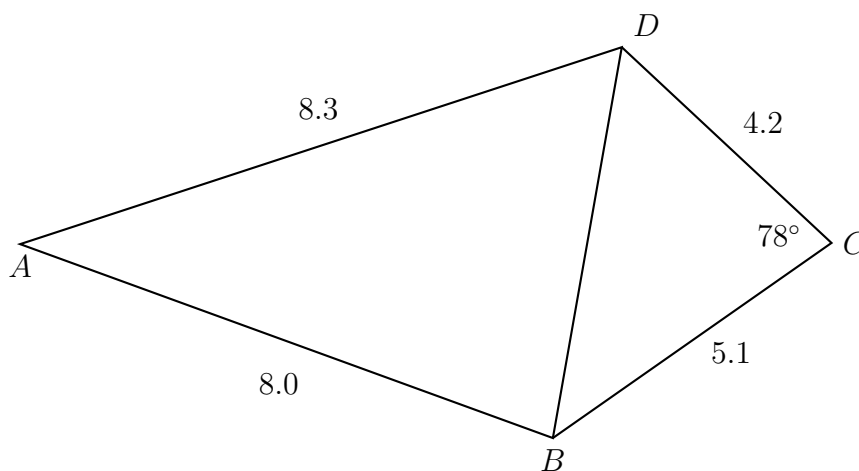
(a) Find  $AC$ .

[3 marks]

(b) Find the area of triangle  $ABC$ .

[3 marks]

13. The following diagram shows quadrilateral  $ABCD$  (not drawn to scale).



$AB = 8.0$ ,  $BC = 5.1$ ,  $CD = 4.2$ ,  $AD = 8.3$ , and  $\hat{B}CD = 78^\circ$

(a) Find  $BD$ .

[3 marks]

(b) Find  $\hat{A}BD$ .

[3 marks]

14. BMI is a measure of a healthy personal weight,

$$BMI = \frac{w}{h^2}$$

where

$w$  is a person's weight in kilograms, and

$h$  is height in meters

- (a) Given a height of 160 cm and weight of 54 kg, find the BMI [3 marks]  
 (b) These measurements are not exact. Assuming the height is between 159-161 cm and weight 53-55 kg, find the bounds of the BMI. [4 marks]
15. Express each value as a decimal, first writing the whole calculator display, and then the 3 sig-fig approximation. [4 marks]

(a)  $\frac{\pi}{6}$

(b)  $\frac{\sqrt{2}}{2}$

16. Express each value as a decimal, rounding to 3 sig-figs if necessary. [3 marks]

(a)  $2.718 \times 10^5$

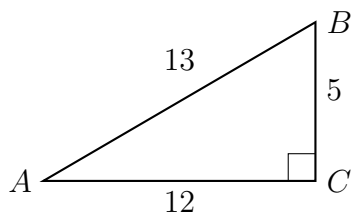
(b)  $6.145 \times 10^{-2}$

17. Find the volume of a cone 6 centimeters in diameter and 10 cm tall. [3 marks]

18. A round beach ball has a volume of  $12348\pi \text{ cm}^3$ . Find its radius. [3 marks]

19. Find the surface area of a cube with side length 5 cm. [2 marks]

20.  $\triangle ABC$  is shown with  $m\angle C = 90^\circ$  and the lengths of the triangle's sides are  $BC = 5$ ,  $AC = 12$ , and  $AB = 13$ . (not drawn to scale)



- (a) Write down the value of  $\cos A$ . [1 mark]

- (b) Find the measure of  $\angle A$ . [2 marks]

21. In right triangle  $ABC$ , hypotenuse  $\overline{AB}$  has a length of 19.5 cm, and side  $\overline{BC}$  has a length of 12.4 cm. What is the measure of angle  $B$ ? [3 marks]

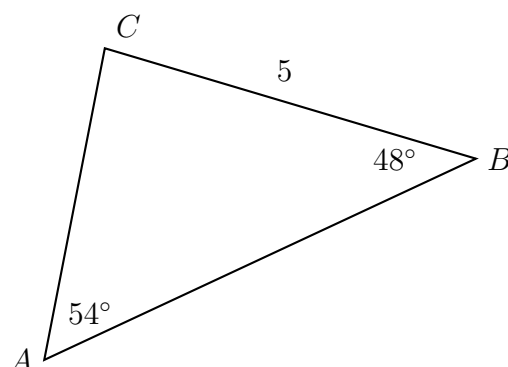
22. Find the slant height of a cone with radius of 1.5 meters and height of 4 m. [3 marks]

23. Triangle  $ABC$  has an area of 22, with  $AB = 6.5$  and  $AC = 7.1$ .

- (a) Find the two possible measures for  $\hat{A}$ . [4 marks]

- (b) Given that  $\hat{A}$  is obtuse, find  $BC$ . [3 marks]

24. The following diagram shows triangle  $ABC$  (not drawn to scale).



$BC = 5$ ,  $\hat{C}AB = 54^\circ$ , and  $\hat{A}BC = 48^\circ$

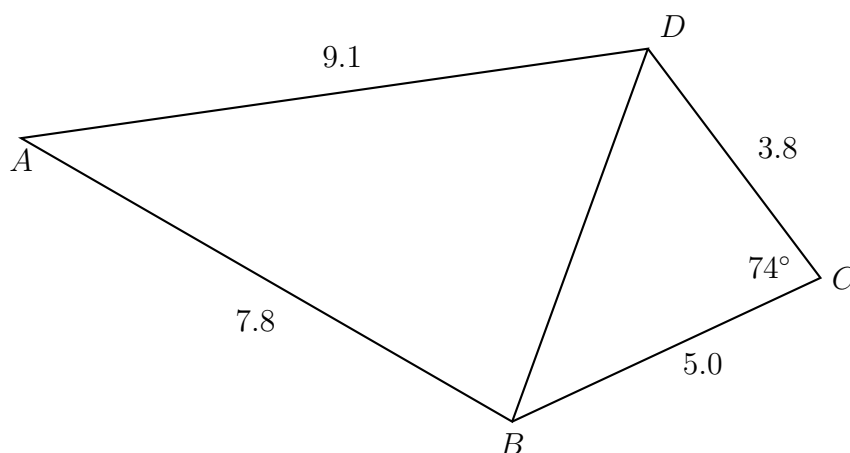
(a) Find  $AC$ .

[3 marks]

(b) Find the area of triangle  $ABC$ .

[3 marks]

25. The following diagram shows quadrilateral  $ABCD$  (not drawn to scale).



$AB = 7.8$ ,  $BC = 5.0$ ,  $CD = 3.8$ ,  $AD = 9.1$ , and  $\hat{BCD} = 74^\circ$

(a) Find  $BD$ .

[3 marks]

(b) Find  $\hat{ABD}$ .

[3 marks]

26. BMI is a measure of a healthy personal weight,

$$BMI = \frac{w}{h^2}$$

where

$w$  is a person's weight in kilograms, and

$h$  is height in meters

- (a) Given a height of 160 cm and weight of 54 kg, find the BMI [3 marks]
- (b) These measurements are not exact. Assuming the height is between 159-161 cm and weight 53-55 kg, find the bounds of the BMI. [4 marks]
27. The following diagram shows a pole BT 1.6 m tall on the roof of a vertical building.  
The angle of depression from T to a point A on the horizontal ground is  $35^\circ$ .  
The angle of elevation of the top of the building from A is  $30^\circ$ .



Find the height of the building.

[7 marks]