Area … Set 2

Using Trigonometry to Find Area

1 An obtuse angle of a parallelogram has a measure of 150°. If the sides of the parallelogram measure 10 and 12 centimeters, what is the area of the parallelogram?

2 The sides of a parallelogram are 6 and 8, and the included angle is 150°. What is the area of the parallelogram?

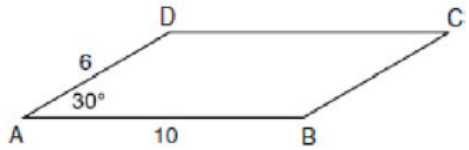
3 What is the area of a parallelogram if two adjacent sides measure 4 and 5 and an included angle measures 60°?

4 What is the area of parallelogram $ABCD$ if $AB = 4$, $AD = 5\sqrt{3}$, and $m\angle A = 60$?

5 What is the area of a parallelogram that has sides measuring 8 cm and 12 cm and includes an angle of 120°?

6 The sides of a parallelogram measure 10 cm and 18 cm. One angle of the parallelogram measures 46 degrees. What is the area of the parallelogram, to the *nearest square centimeter*?

7 In the accompanying diagram of parallelogram $ABCD$, $m\angle A = 30$, $AB = 10$, and $AD = 6$. What is the area of parallelogram $ABCD$?



8 Two sides of a parallelogram are 24 feet and 30 feet. The measure of the angle between these sides is 57°. Find the area of the parallelogram, to the *nearest square foot*.

Answers

1 ANS:
60 cm^2

2 ANS:
24

3 ANS:
$10\sqrt{3}$

4 ANS:
30

$A = 4 \cdot 5\sqrt{3} \sin 60 = 20\sqrt{3} \cdot \frac{\sqrt{3}}{2} = 30$

5 ANS:
$48\sqrt{3}$

$K = 8 \cdot 12 \sin 120 = 96 \cdot \frac{\sqrt{3}}{2} = 48\sqrt{3}$

6 ANS:
129
$K = (10)(18) \sin 46 \approx 129$

7 ANS:
30. $K = (10)(6) \sin 30° = 30$

8 ANS:
$K = ab \sin C = 24 \cdot 30 \sin 57 \approx 604$

Area … Set 2

9 The two sides and included angle of a parallelogram are 18, 22, and 60°. Find its exact area in simplest form.

10 Find, to the *nearest tenth of a square foot*, the area of a rhombus that has a side of 6 feet and an angle of 50°.

11 In parallelogram $ABCD$, $AD = 11$, diagonal $AC = 15$, $m\angle BAD = 63°50'$. Find, to the *nearest ten minutes*, the measure of $\angle ACD$. Find, to the *nearest integer*, the area of parallelogram $ABCD$.

12 The area of a parallelogram is 594, and the lengths of its sides are 32 and 46. Determine, to the *nearest tenth of a degree*, the measure of the acute angle of the parallelogram.

Answers

9 ANS:

$$K = ab\sin C = 18 \cdot 22 \sin 60 = 396\frac{\sqrt{3}}{2} = 198\sqrt{3}$$

10 ANS:

$$K = ab\sin C = 6 \cdot 6 \sin 50 \approx 27.6$$

11 ANS:

$41°10'$, 64

12 ANS:

$$594 = 32 \cdot 46 \sin C$$

$$\frac{594}{1472} = \sin C$$

$$23.8 \approx C$$