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GRE数学

4.1 平面几何

M A K E I T E A S Y

4.1.1直线和角

Vertical Angle（对角）：两条直线相交形成的角成为对顶角，两个角相等，180度的角称为平角（straight angle），小于90度的角称为锐角（acute angle），大于90度小于180度的角称为顿角（obtuse angle），等于90度的角称为直角（right angle）。

4.1.2三角形的角和边

三角形基本性质

在三角形中，任一边的长度小于其他两条边长度的和。
推论：三角形中两边之差小于第三边。

三角形中，大角对大边，小角对小边。

三角形的一个外角等于其不相邻两个内角的和。

4.1.3特殊三角形

直角三角形勾股定理

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直角三角形勾股定理

1. 等腰直角三角形（1:1:$\sqrt{2}$)
2. 30度直角三角形（1:2:$\sqrt{3}$)
3. 其他比例（3:4:5/5:12:13）

4.1.3特殊三角形

其他特殊三角形

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其他特殊三角形

1. Isosceles Triangles（等腰三角形）

2. Equilateral Triangles（等边三角形）

面积=$A = \frac{s^2\sqrt{3}}{4}$

4.1.4多边形

1. The Square（正方形）
2. Rectangles（矩形）
3. Parallelograms（平行四边形）
4. 多边形内角和公式

内角和=（n-2）180（n为边数）

4.1.5圆

1. Radius（半径）
2. Diameter（直径）
3. Circumference（周长）
4. Arc（弧长）
5. Sector（扇形）

4.1.5圆

圆方程:
$(x - a)^2 + (y - b)^2 = r^2$, where the center is (a,b) and radius is r.

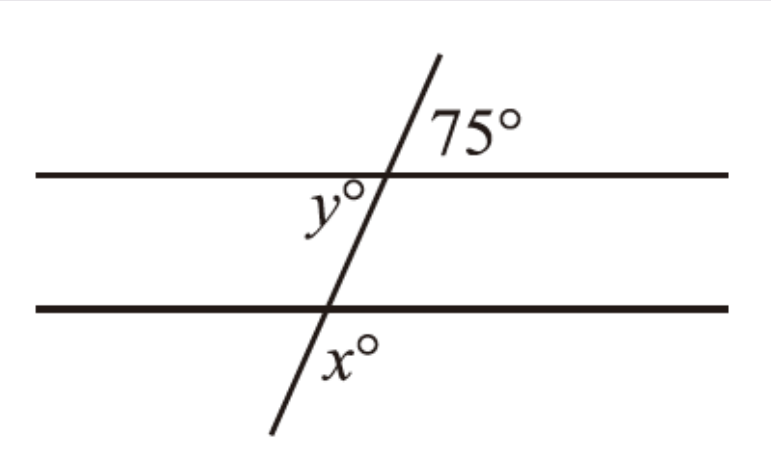
圆面积: $A = \pi r^2$

圆周长: $C = \pi d = 2\pi r$

在圆中: $\frac{\text{弧长}}{\text{周长}} = \frac{\text{弧长所对应的角度}}{360°}$

4.1.6练习

1. Quantity A: x
Quantity B: y



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2. P, Q, and R are three points in a plane, and R does not lie on line PQ. Which of the following is true about the set of all points in the plane that are the same distance from all three points?

A. It contains no points.
B. It contains one point.
C. It contains two points.
D. It is a line.
E. It is a circle.

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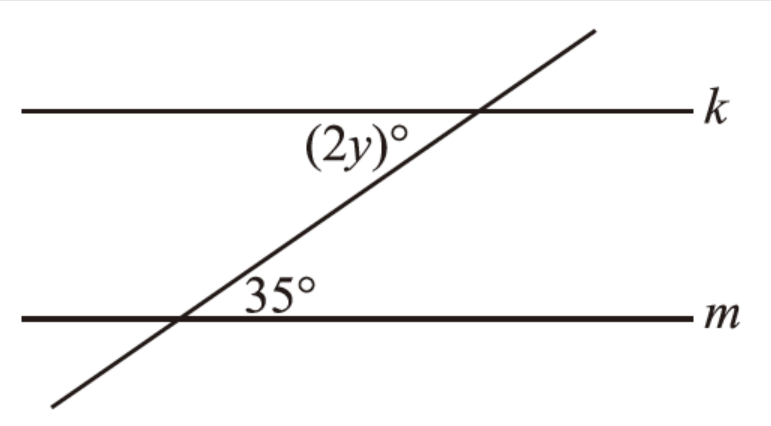
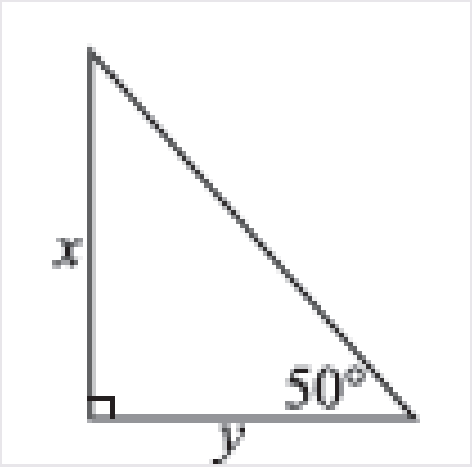
3. In the figure below, line k is parallel to line m. What is the value of y?



4. Quantity A: The length of a side of a regular pentagon with a perimeter of 12.5

Quantity B: The length of a side of a regular hexagon with a perimeter of 15

5. A=$\frac{x}{y}$, B=1.



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6. If the lengths of two sides of a triangle are 5 and 9, respectively, which of the following could be the length of the third side of the triangle?
Indicate all such lengths.

A. 3
B. 5
C. 8
D. 15

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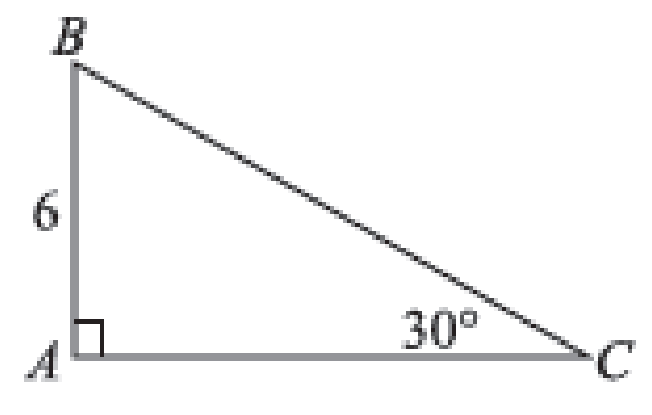
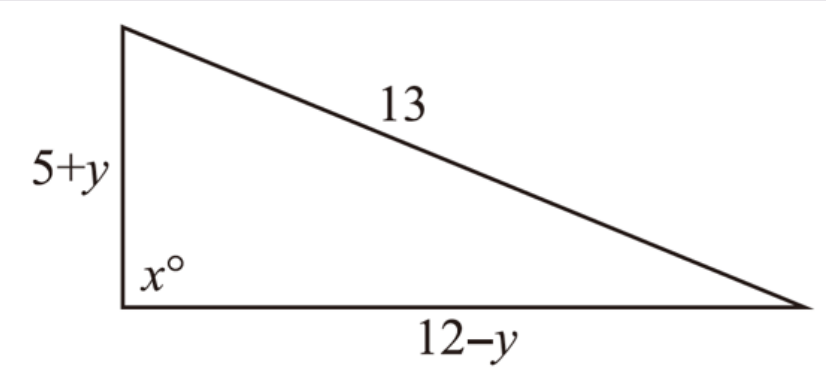
7. What is the area of triangle ABC shown below?



A. 20
B. 18
C. $12\sqrt{3}$
D. $18\sqrt{3}$
E. 36

8. Quantity A: x
Quantity B: 90



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9. What is the perimeter, in meters, of a rectangular playground 24 meter wide that has the same area as a rectangular playground 64 meters long and 48 meters wide?

A. 112
B. 152
C. 224
D. 256
E. 304

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10. In the xy-plane, a quadrilateral has vertices at (-1, 4), (7, 4), (7, -5), and (-1, -5). What is the perimeter of the quadrilateral?

A. 17
B. 18
C. 19
D. 32
E. 34

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11. The length of each side of rectangle R is an integer, and the area of R is 36.

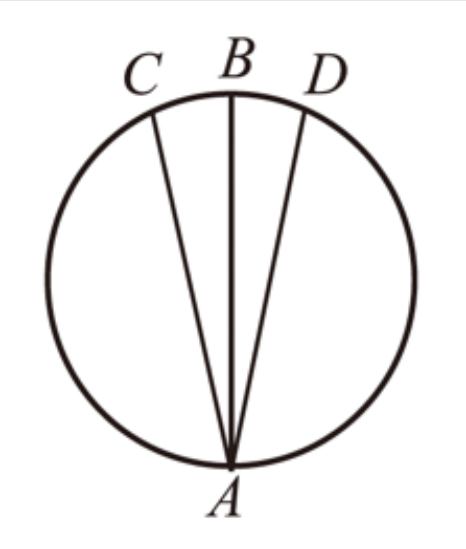
Quantity A: The number of possible values of the perimeter of R

Quantity B: 6

12. AB is a diameter of the circle below

Quantity A: The length of AB

Quantity B: The average (arithmetic mean) of the lengths of AC and AD



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13. The relationship between the area A of a circle and its circumference C is given by the formula $A=kC^2$, where k is a constant. What is the value of k?

A. $\frac{1}{4\pi}$
B. $\frac{1}{2\pi}$
C. $\frac{1}{4}$
D. 2π
E. $4\pi^2$

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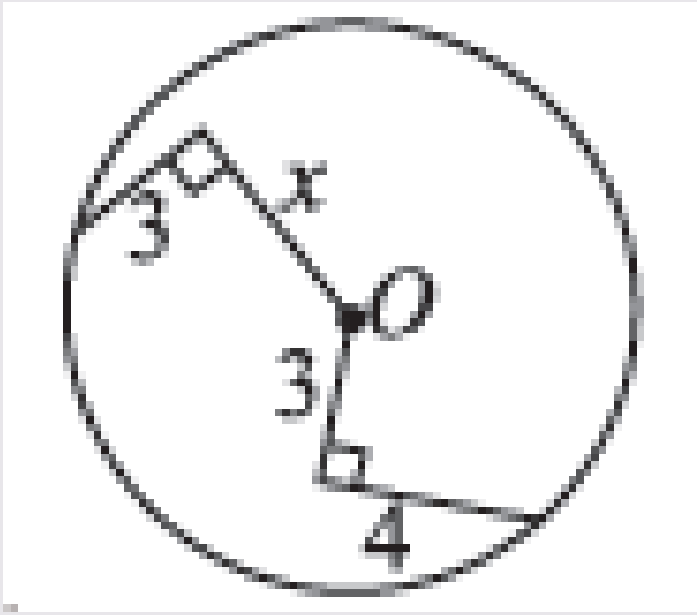
14. O is the center of the circle below.
A=x, B=5



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Thanks

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