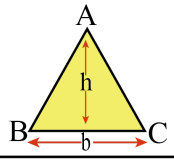
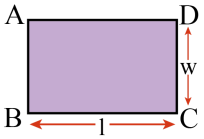
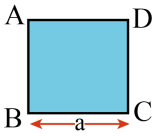
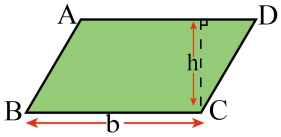
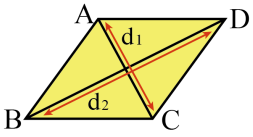
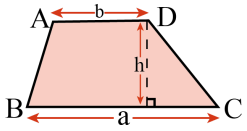
L3 Coordinate Plane and Geometry

Concept 1: Polygon, Circle and Composite Figure

Area of Polygons

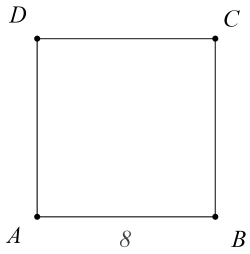
Polygons	Shapes	Formulas
Triangle		Area(A)=$\frac{1}{2}$(b×h) here, b=base, h=height
Rectangle		Area(A)= w×l here, w=width, l=length
Square		Area(A)= a^2 here, a=side
Parallelogram		Area(A)=(b×h) here, b=base, h=height
Rhombus		Area(A)= $\frac{d_1 \times d_2}{2}$ here, d_1 and d_2 are the diagonals
Trapezoid		Area(A)=$\frac{1}{2}$(a+b)×h here, a=longbase b=short base h=height

Think Academy

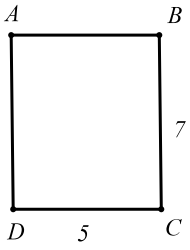
Math Exploration 1

1 Find the area of the following figures:

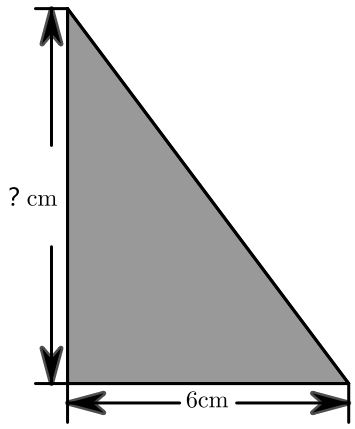
(1) Area of Square $ABCD$: _____ .



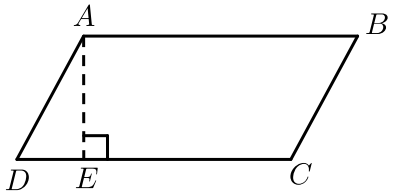
(2) Area of Rectangle $ABCD$: _____ .



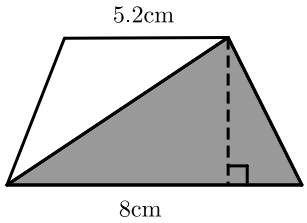
2 The area of the following rectangle is 30cm^2. One of the leg is 6cm long. The length of the other leg is _____ cm.



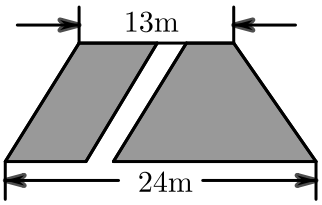
3 In parallelogram $ABCD$, $AB = 12$ cm, $AE = 5$ cm, so the area of it is _____ cm^2.



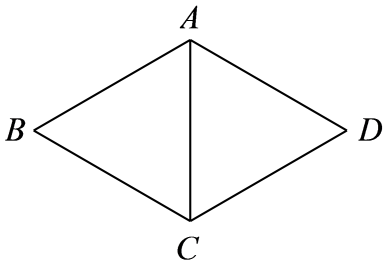
4 In the figure, the upper base of the trapezoid is $5.2cm$, the lower base of the trapezoid is $8cm$. The area of shaded region is $20cm^2$, the area of the trapezoid is _____ cm^2.



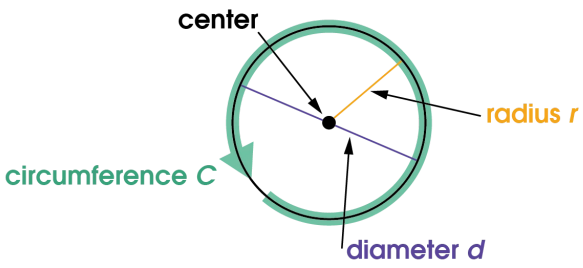
5 As shown in the figure, a gardener paved a parallelogram-shape cobblestone road with a base of $3m$ in a trapezoid garden. The area of the cobblestone raod is $27m^2$, what is the actual area for the flower beds? (shaded region)



6 In the figure, $ABCD$ is a rhombus, $AB = 5$, $m\angle BCD = 120°$, the perimeter of $\triangle ABC$ is _____ .

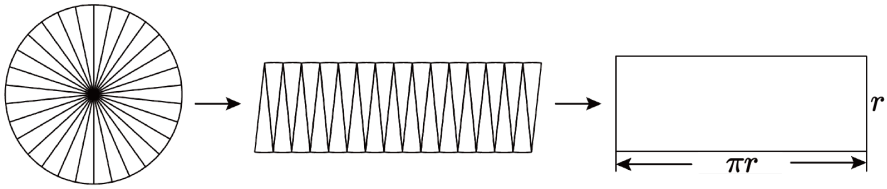


A. 20 B. 15 C. 10 D. 5



$d = 2r$

$C = 2\pi r = dr$



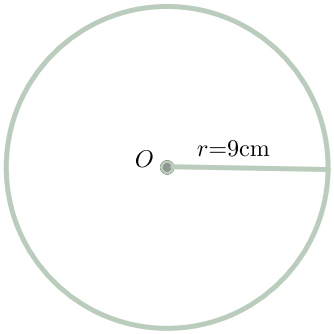
$A = \pi r^2$

Math Exploration 2

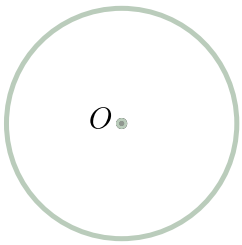
7 The diameter of a circle is 6cm, the circumference of the circle is _____ and the area of the circle is _____ . (keep π in your answer)

8 Calculate the area of circle based on the given information.(keep π in the answer)

(1)



(2)

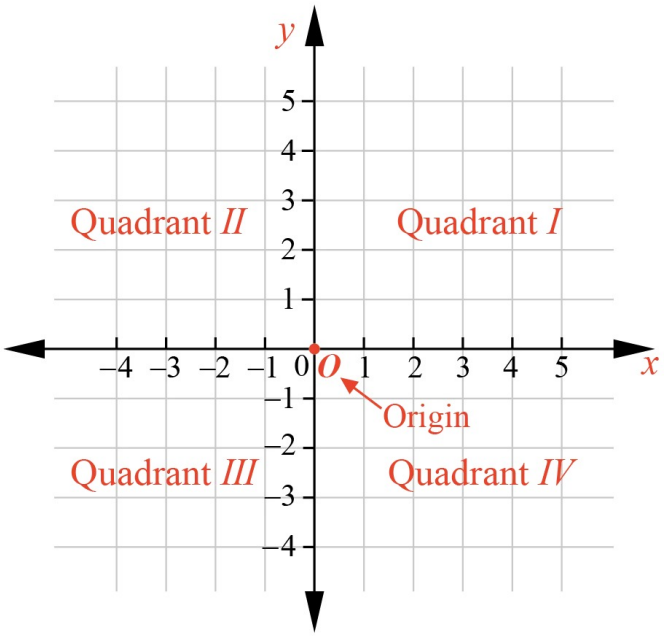


$C = 22\pi\ \text{cm}$

Concept 2: Coordinate Plane

For an ordered pair (x, y) in the coordinate plane,

1. if $x > 0$ and $y > 0$, (x, y) is in Quadrant _____ ;
2. if $x < 0$ and $y > 0$, (x, y) is in Quadrant _____ ;
3. if $x < 0$ and $y < 0$, (x, y) is in Quadrant _____ ;
4. if $x > 0$ and $y < 0$, (x, y) is in Quadrant _____ .



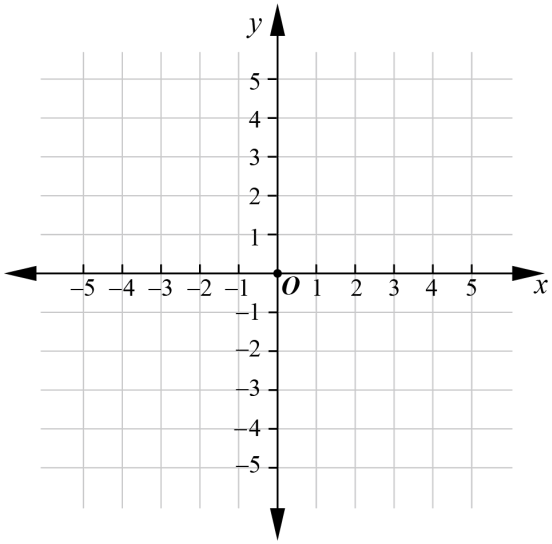
Special Positions:

1. if $x = 0, (x, y)$ is on the _____ -axis;
2. if $y = 0, (x, y)$ is on the _____ -axis;
3. If $x = y = 0, (x, y)$ is on the _____ .

Points that are on the x-axis and y-axis are not in any of the quadrants.

Math Exploration 3

9 Plot $A(-2,2)$, $B(1,1)$, and $C(-3,1)$ in the coordinate plane.



10 Which of the following points is in Quadrant III?

A. $(5,-5)$ B. $(-5,5)$ C. $(5,5)$ D. $(-5,-5)$

11 If $P(a,b)$ is in Quadrant IV, then

(1) $P_1(a,-b)$ is in Quadrant _____ .

(2) $P_2(-a,b)$ is in Quadrant _____ .

(3) $P_3(-a,-b)$ is in Quadrant _____ .

12 In the coordinate plane, point A is on y-axis above the origin. It is two units away from the origin and the coordinates of A is _____ .

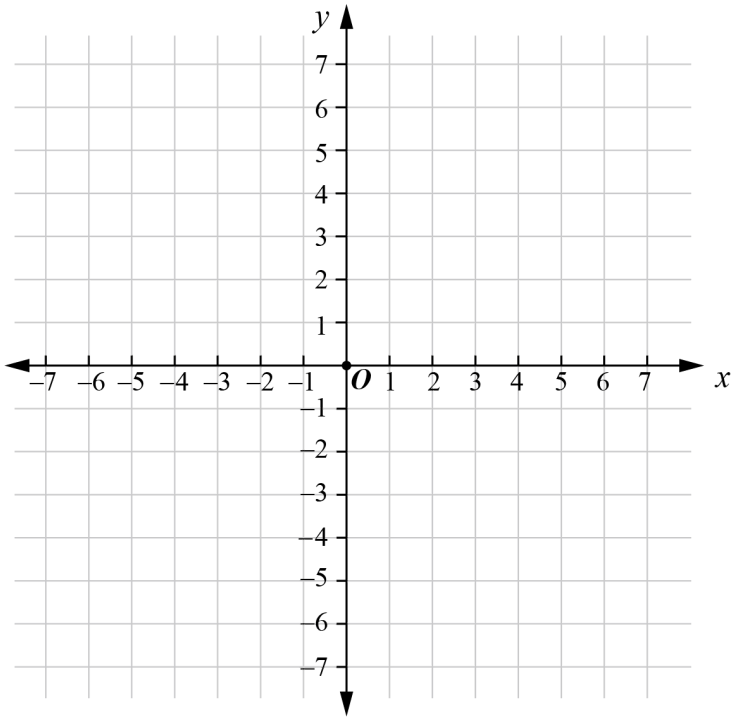
A. $(2,0)$ B. $(-2,0)$ C. $(0,2)$ D. $(0,-2)$

13 If $P(x,y)$ is in Quadrant IV, and $|x|=2$, $|y|=3$. Then $x+y=$ ( ) .

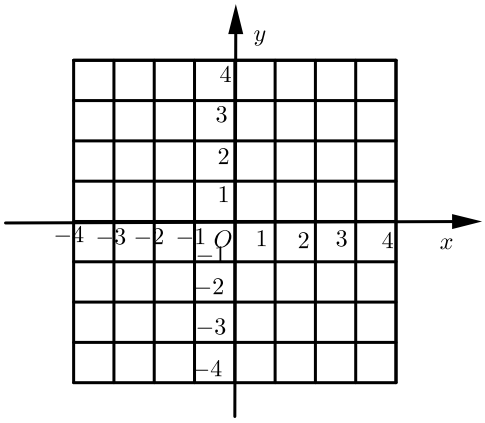
A. -1 B. 1 C. 5 D. -5

Math Exploration 4

14 The distance between the point $(-4,2)$ and the x-axis is _____ , and the distance between this point and the y-axis is _____ .



15 Find the distance between each pair of points.

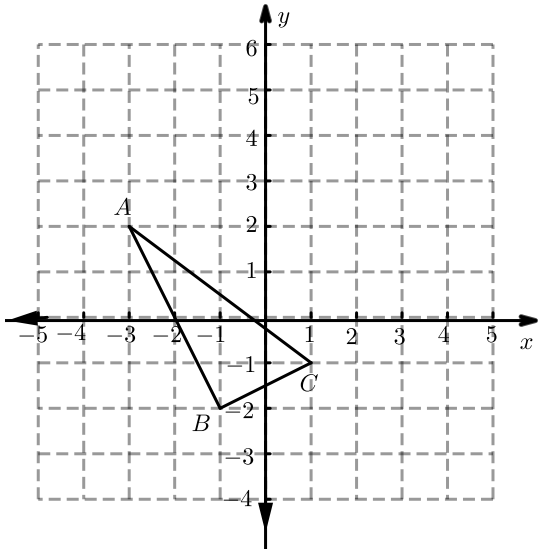


(1) The distance between point $(4, -1)$ and $(7, -1)$ is _____ .

(2) The distance between point $(-2, -3)$ and $(-2, -8)$ is _____ .

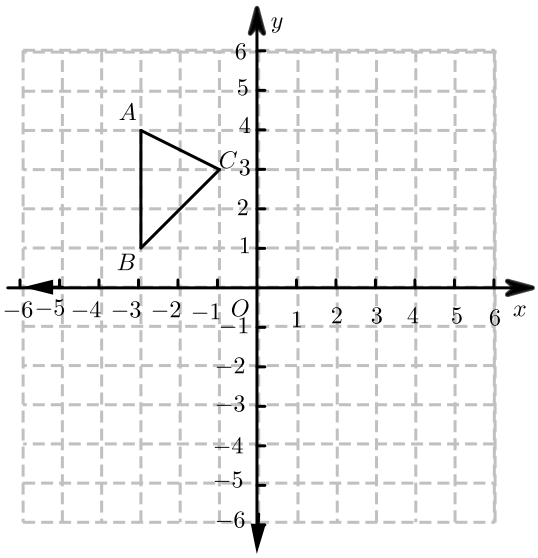
Math Exploration 5

16 $A(-3, 2)$, $B(-1, -2)$ and $C(1, -1)$ are points in the coordinate plane. The area of $\triangle ABC$ is _____ .



17 In the coordinate plane, $\triangle ABC$'s three vertices are $A(-3,4)$, $B(-3,1)$, $C(-1,3)$.

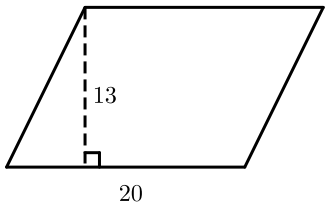
What is the area of the triangle?



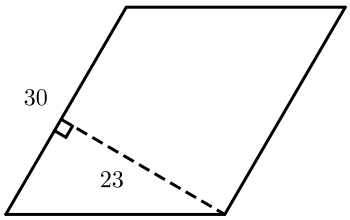
Homework

18 Find the area of the following parallelograms.

(1) $A =$ _____ .

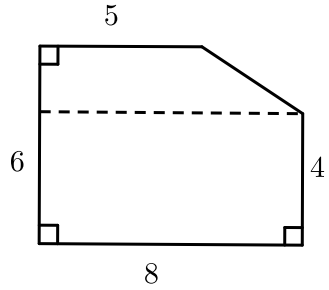


(2) $A =$ _____ .

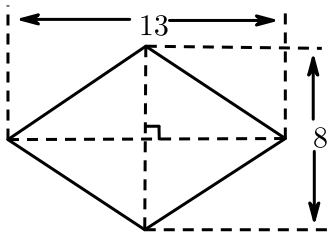


19 What percent is the shaded area to the whole? _____ %

20 The area of the composite figure is _____ .

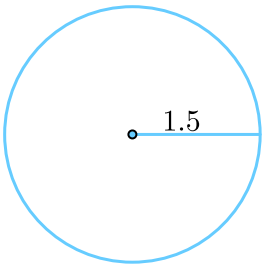


21 The area of the following rhmbus is _____ .

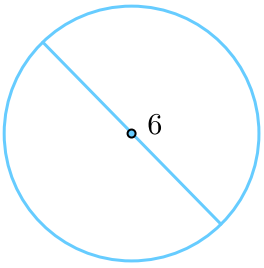


22 FInd the area and circumference of the following circles.

(1) $A=$ _____ . $C=$ _____ .



(2) $A=$ _____ . $C=$ _____ .

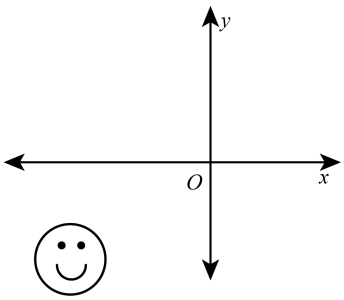


23 For the ordered pair $P(-3,2)$, where does it belong to?

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

E. y-axis/x-axis

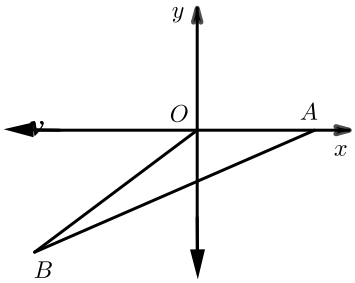
24 Which of the following is a possible coordinate of the smiley face?



A. $(3, 2)$ B. $(-3, 2)$ C. $(-2, -2)$ D. $(3, -2)$

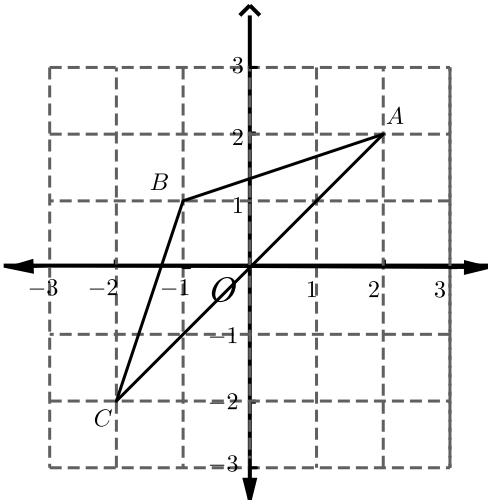
25 Point $A(a, 5)$ is 3 units right from the y-axis, $a =$ _____ .

26 Point $A(3, 0)$, $B(-3, -4)$, and $O(0, 0)$ are in the coordinate plane. What is the area of $\triangle AOB$?



A. 4 B. 6 C. 8 D. 3

27 $\triangle ABC$ is in the coordinate plane as shown below. The area of $\triangle ABC$ is _____ .



A. 2 B. 3 C. 4 D. $4\sqrt{2}$