2 Chapter Self-Test

Process Checklist

- ✔ Questions 1, 2, 6, and 8: Did you make **connections** between analytical geometry and the situation?
- ✔ Questions 3 and 4: Did you apply **reasoning** skills to construct a mathematical argument to confirm each figure type?
- ✔ Question 7: Did you use appropriate mathematical vocabulary to **communicate** your thinking?

1. An underground cable is going to be laid between points $A(-6, 23)$ and $B(14, -12)$.

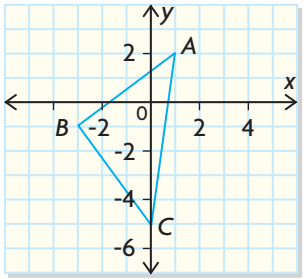
a) If each unit represents 1 m, what length of cable will be needed? Give your answer to the nearest metre.

b) An access point will be located halfway between the endpoints of the cable. At what coordinates should the access point be built?

2. A stone is tossed into a pond, creating a circular ripple. The radius of the ripple increases by 12 cm/s.

a) Write an equation that describes the ripple exactly 3 s after the stone lands in the water. Use the origin as the point where the stone lands in the water.

b) A bulrush is located at point $(-36, 48)$. When will the ripple reach the bulrush?



3. The triangle at the left has vertices at $A(1, 2)$, $B(-3, -1)$, and $C(0, -5)$. Use analytic geometry to show that the triangle is an isosceles right triangle.

4. The corners of a building lot are marked at $P(-39, 39)$, $Q(-78, -13)$, $R(26, -91)$, and $S(65, -39)$ on a grid.

a) Verify that $PQRS$ is a rectangle.

b) What is the perimeter of the building?

5. Quadrilateral $JKLM$ has vertices at $J(2, 4)$, $K(6, 1)$, $L(2, -2)$, and $M(-2, 1)$. What type of quadrilateral is $JKLM$?

6. Three straight paths in a park form a triangle with vertices at $A(-24, 16)$, $B(56, -16)$, and $C(-72, -32)$. A new fountain is the same distance from the intersections of the three paths. Determine the location of the new fountain.

7. Explain how you can use analytic geometry to calculate the distance from a known point to a line that passes through two other known points.

8. The sides of a triangle are defined by the equations $x + 2y - 2 = 0$, $2x - y - 4 = 0$, and $3x + y + 9 = 0$. Determine the type of triangle that is formed by these three sides.