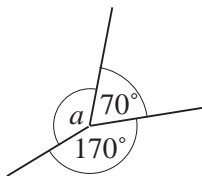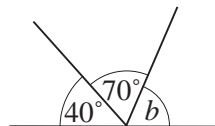# UNIT 15 *Polygons* **Extra Exercises 15.1**

1. Calculate the size of the angle marked with a letter in each of the following diagrams:
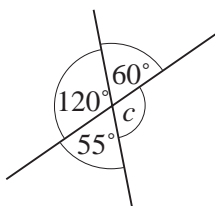
   (a)

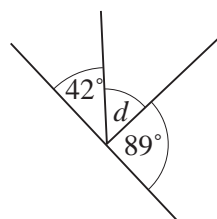
   (b)

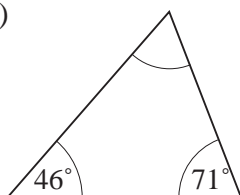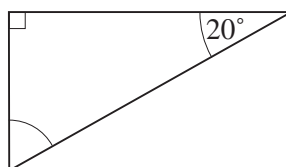   (c)

   (d)

2. Calculate the size of the unknown angle in each of the following triangles:
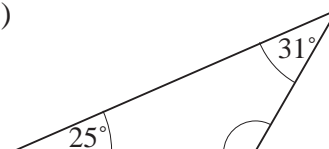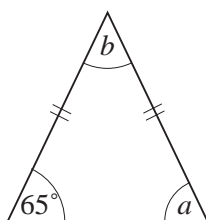
   (a)

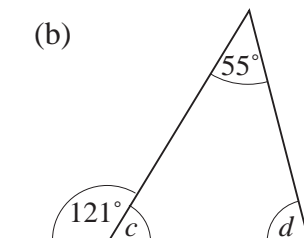   (b)

   (c)

3. Calculate the size of each of the angles marked with a letter in the following diagrams:

   (a)

   (b)

   (c)
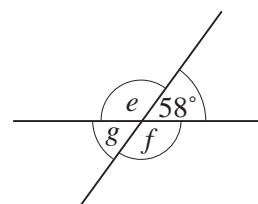
   (d)
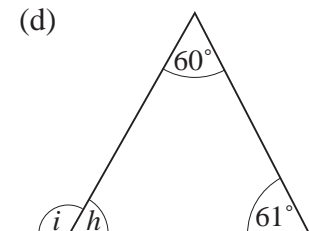
   (e)
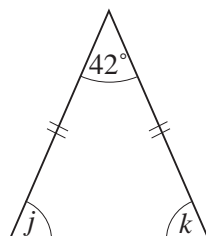
   (f)
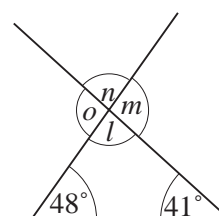
UNIT 15   *Polygons*   **Extra Exercises 15.2**

1.   Calculate the sizes of the exterior angles of a regular polygon which has interior
      angles of:

      (a)   160 °

      (b)   156 °

      (c)   144 °

2.   Calculate the size of both the exterior and interior angles of a regular polygon with:

      (a)   15 sides,

      (b)   40 sides,

      (c)   18 sides.

3.   The exterior angle of a regular polygon is 15 °. How many sides does this polygon have?

4.   How many sides does a polygon have, if its exterior angle is 5 °?

UNIT 15   *Polygons*   **Extra Exercises 15.3**

1.   Copy each of the following shapes and draw in all the lines of symmetry.

(a)   (b)

(c)   (d)
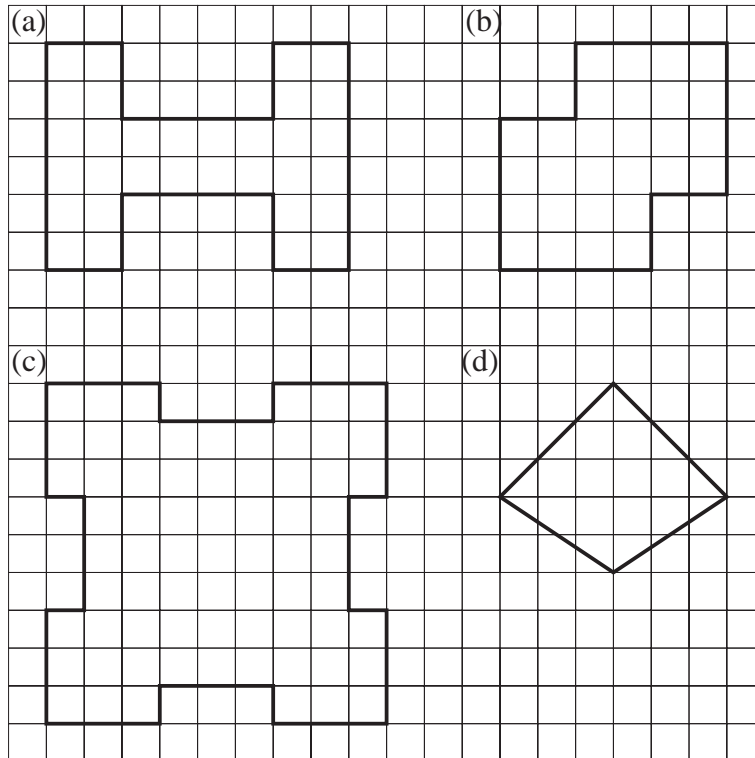
2.   State the order of rotational symmetry of each of the following shapes:

(a)   (b)   (c)
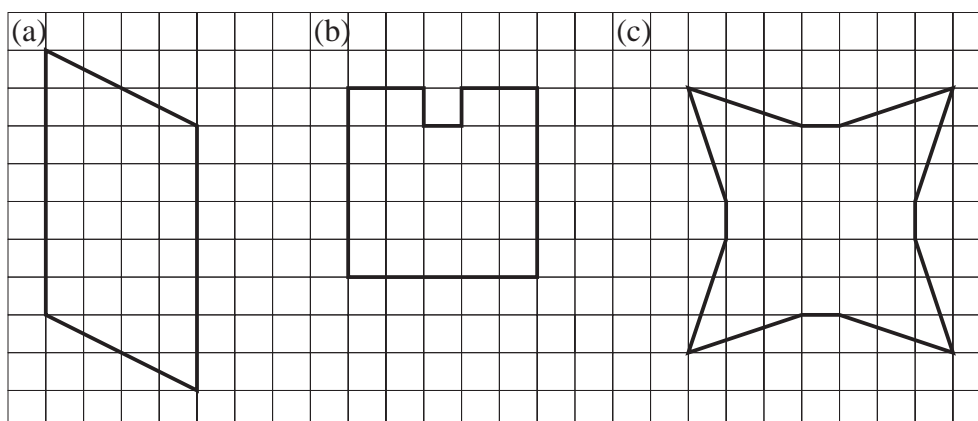
3.   Draw a shape which has:

(a)   1 line of symmetry, and rotational symmetry of order 1,

(b)   4 lines of symmetry, and rotational symmetry of order 4, but which is *not* a square.

UNIT 15 *Polygons*

Extra Exercises 15.4

1. Copy the diagram below and complete each of the shapes to form the type of quadrilateral stated.

(a) SQUARE

(b) PARALLELOGRAM

(c) RHOMBUS
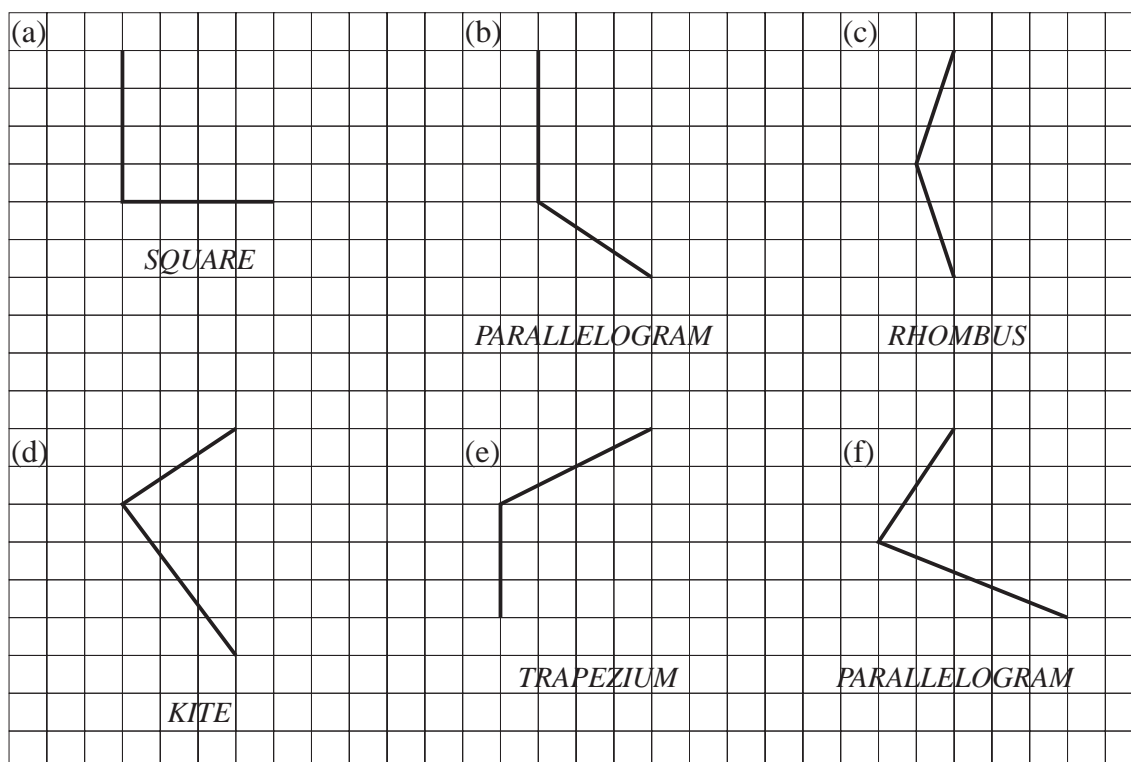
(d) KITE

(e) TRAPEZIUM

(f) PARALLELOGRAM

2. Is each of the following statements *true* or *false* ?

(a) A *square* is also a *parallelogram*.

(b) A *square* is also a *kite*.

(c) A *kite* is also a *rhombus*.

(d) A *rhombus* is also a *kite*.

(e) A *rectangle* is also a *rhombus*.

(f) A *rectangle* is also a *parallelogram*.

3. Which quadrilaterals have diagonals that are always equal in length?

4. Draw a trapezium that is neither a square nor a rectangle, but that has diagonals the same length.
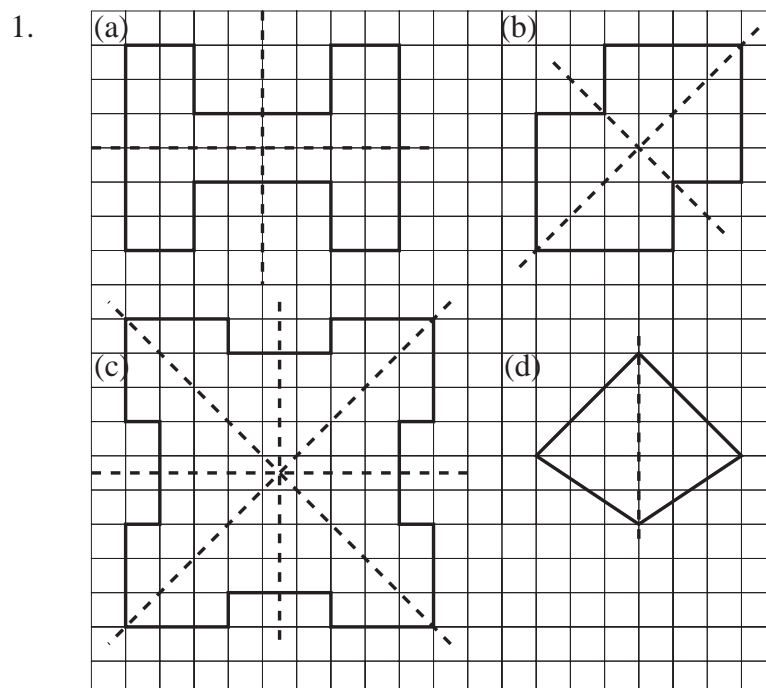
Extra Exercises 15.1   Answers

1. (a) $a = 120°$ (b) $b = 70°$ (c) $c = 125°$ (d) $d = 49°$

2. (a) $63°$ (b) $70°$ (c) $124°$

3. (a) $a = 65°$, $b = 50°$ (b) $c = 59°$, $d = 66°$

    (c) $e = 122°$, $f = 122°$, $g = 58°$ (d) $h = 59°$, $i = 121°$

    (e) $j = k = 69°$ (f) $l = n = 91°$, $o = m = 89°$

Extra Exercises 15.2   Answers

1. (a) $20°$ (b) $24°$ (c) $36°$

2. (a) $24°$, $156°$ (b) $9°$, $171°$ (c) $20°$, $160°$

3. 24 sides

4. 72 sides

Extra Exercises 15.3   Answers

1. (a)   (b)
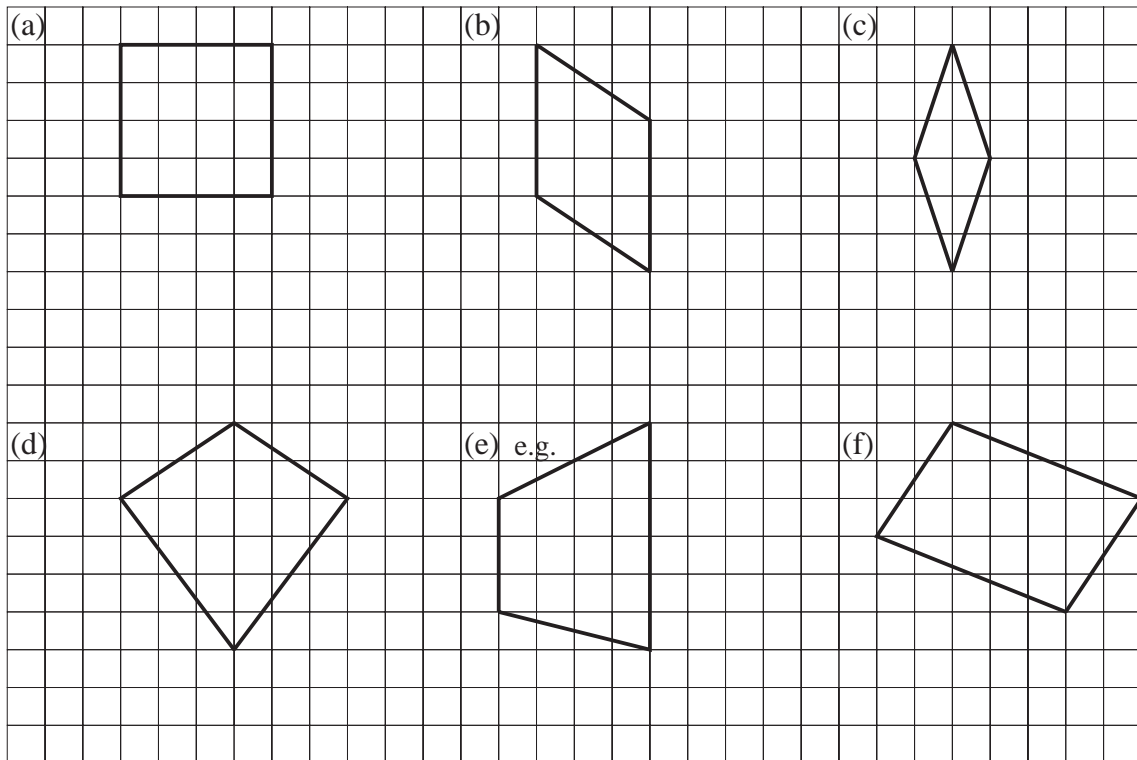

    (c)   (d)

2. (a) 2   (b) 1   (c) 4

3. (a) For example see question 2 (b).

    (b) For example see question 2 (c).

Extra Exercises 15.4   Answers

1.   (a)   (b)   (c)

(d)   (e) e.g.   (f)

2.   (a)   *True*   (b)   *True*   (c)   *False*

(d)   *True*   (e)   *False*   (f)   *True*

3.   Square, Rectangle

4.