

Lesson 7

GCSE Mathematics Transformation Geometry

7.1 T4 Enlargement with Negative Scale Factor

In Lesson 6 it was observed that what mathematicians call an enlargement can sometimes result in a smaller shape.

SF1 IF *scale factor* > 1 THEN a bigger, similar shape results.

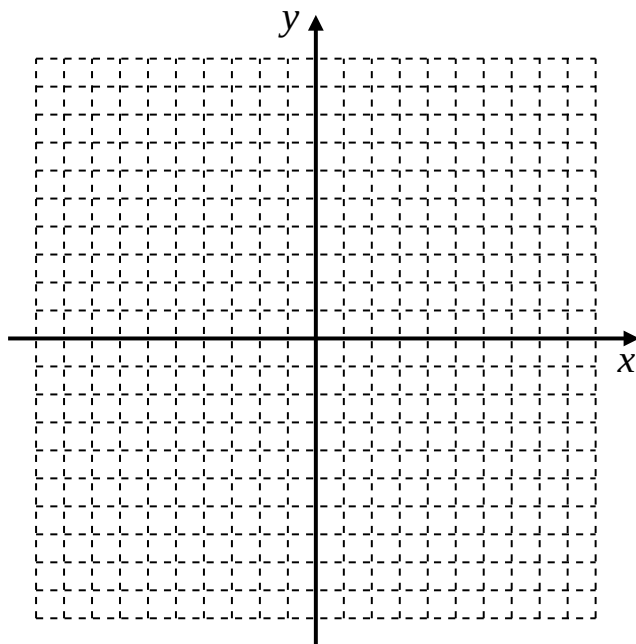
SF2 IF $0 < \textit{scale factor} < 1$ THEN a smaller, similar shape results.

7.2.1 Example

What happens if (a) *scale factor* = 1 ?

(b) *scale factor* = 0 ?

7.2.2 Example



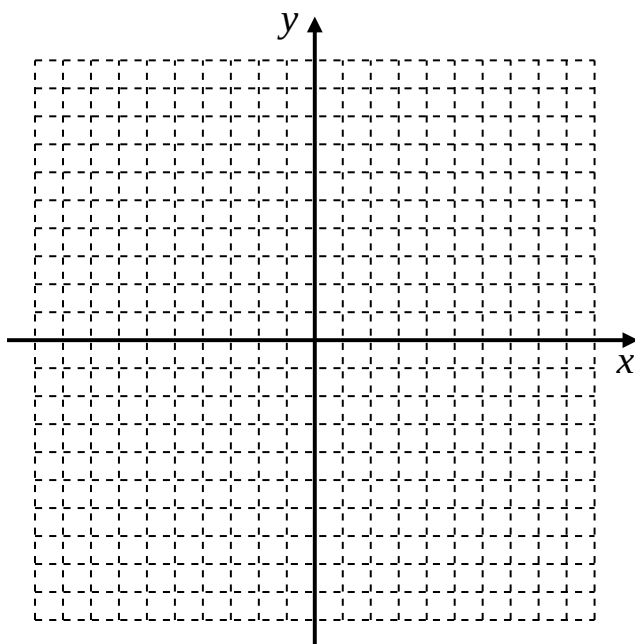
(a) Plot the ARROW-shape with vertices;

$A (3, 3),$ $B (6, 0),$ $C (9, 3),$ $D (7, 3),$
 $E (7, 9),$ $F (3, 9),$ $G (3, 7),$ $H (5, 7),$
 $I (5, 3).$

(b) Enlarge the ARROW with scale factor -2 and centre $(3, 3)$

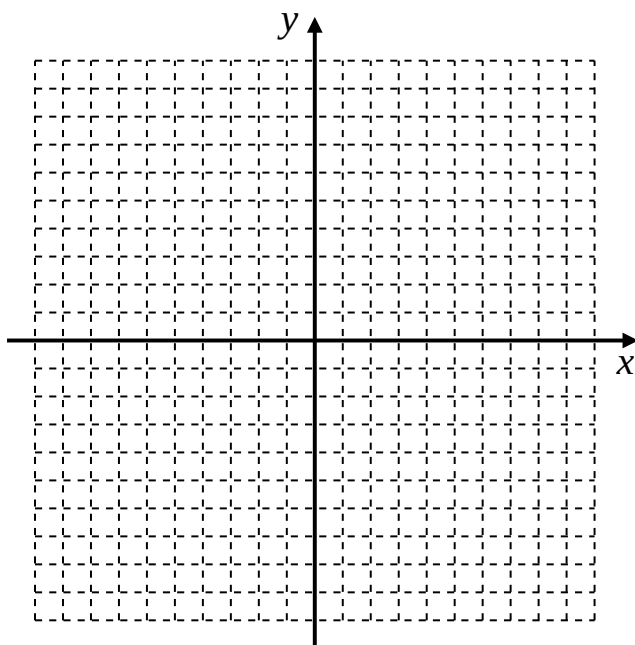
7.3 Exercise

Question 1



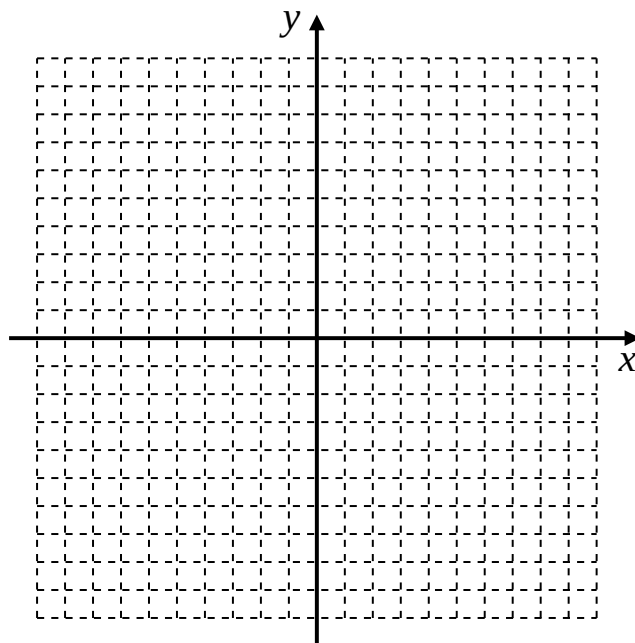
- (a) Plot the FLAG with vertices;
 $Q(6, 8)$, $R(6, 2)$, $S(7, 2)$,
 $T(7, 6)$, $U(9, 6)$, $V(9, 8)$.
- (b) Enlarged FLAG with scale factor -3 , centre $(5, 4)$.

Question 2



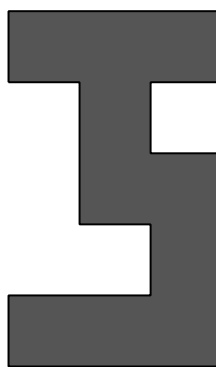
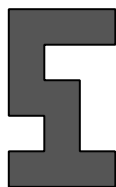
- (a) Plot (carefully!) the BUZZ-SAW shape with vertices;
 $S(-7, 7)$, $T(-8, 8)$, $U(-8, 9)$, $V(-9, 8)$
 $W(-10, 8)$, $X(-9, 7)$, $Y(-9, 6)$, $Z(-8, 7)$
- (b) Enlarge the BUZZ-SAW by scale factor -3 , centre $(-5, 5)$

Question 3



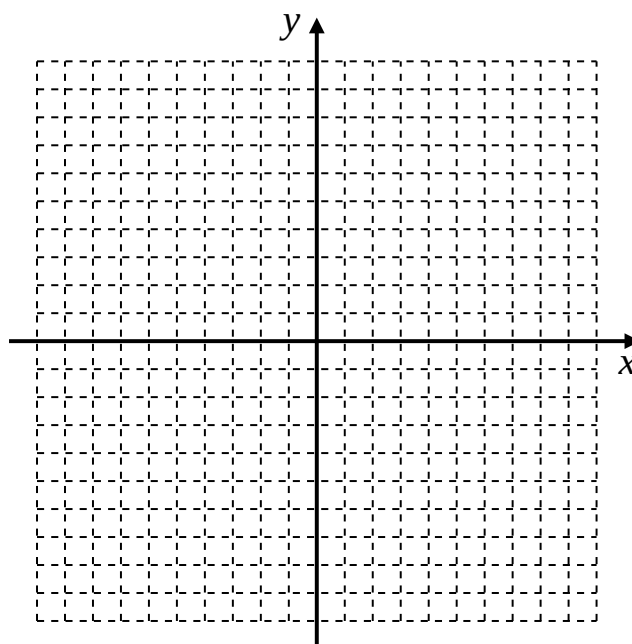
- (a) Plot the CROSS shape with vertices;
 $A(-1, 2)$, $B(-1, 5)$, $C(-4, 5)$, $D(-4, 8)$,
 $E(-7, 8)$, $F(-7, 5)$, $G(-10, 5)$, $H(-10, 2)$,
 $I(-7, 2)$, $J(-7, -7)$, $K(-4, -7)$, $L(-4, 2)$
- (b) Label your cross $X1$.
- (c) Enlarge the CROSS by scale factor -1 , centre $(-1, 0)$
- (d) Label the enlargement $X2$.
- (e) What other transformation would move $X1$ to $X2$?

Question 4



Use a straight edge to draw lines that show where the centre of the enlargement is.

Question 5



- (a) Plot the DART shape with vertices;
- $H(9, 0)$, $I(1, 4)$, $J(-3, 8)$, $K(-9, 6)$,
 $L(-3, 0)$, $M(-9, -5)$, $N(-3, -8)$, $O(1, -4)$
- (b) Enlarge the DART by scale factor -0.5 , centre $(3, 4)$.