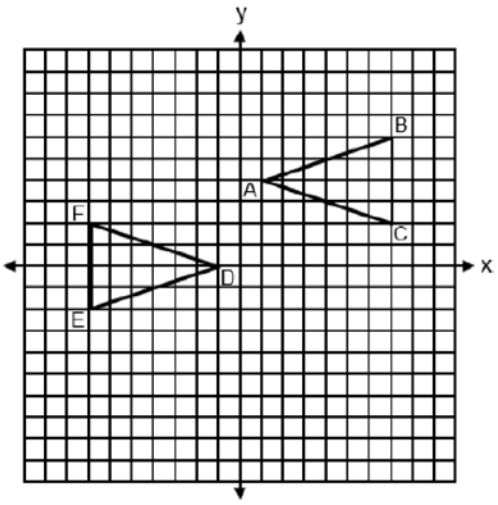
2024 Geometry Sample Items

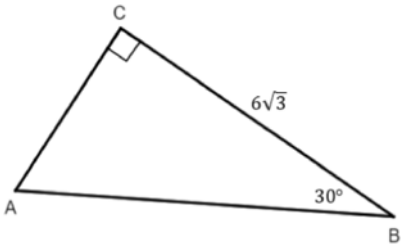
1 Triangles *ABC* and *DEF* are graphed on the set of axes below.



Which sequence of rigid motions maps $\triangle ABC$ onto $\triangle DEF$?

1) A reflection over $y = -x + 2$.
2) A point reflection through $(0,2)$.
3) A translation 2 units left followed by a reflection over the x-axis.
4) A translation 4 units down followed by a reflection over the y-axis.

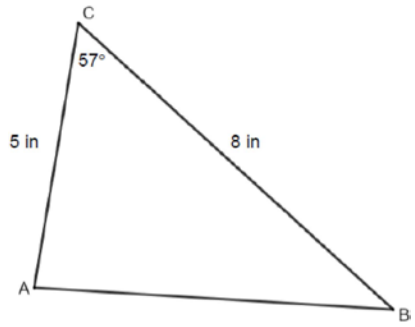
2 In right triangle *ABC* below, $m\angle C = 90°$, $m\angle B = 30°$, and $CB = 6\sqrt{3}$.



The length of $\overline{AB}$ is

1) $3\sqrt{3}$
2) 9
3) 12
4) $12\sqrt{3}$

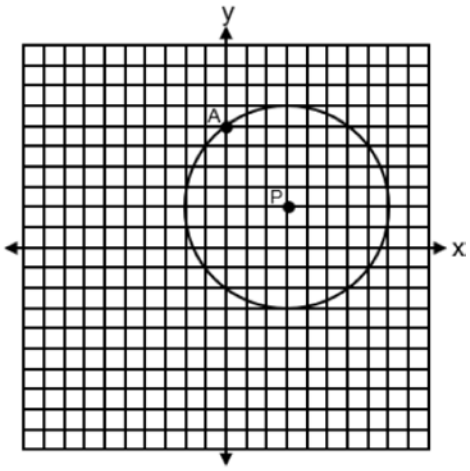
3 In non-right triangle ABC shown below, $AC = 5$ in, $BC = 8$ in, and $m\angle C = 57°$.



What is the area of $\triangle ABC$, to the *nearest tenth of a square inch*?

1) 10.9
2) 16.8
3) 21.8
4) 33.5

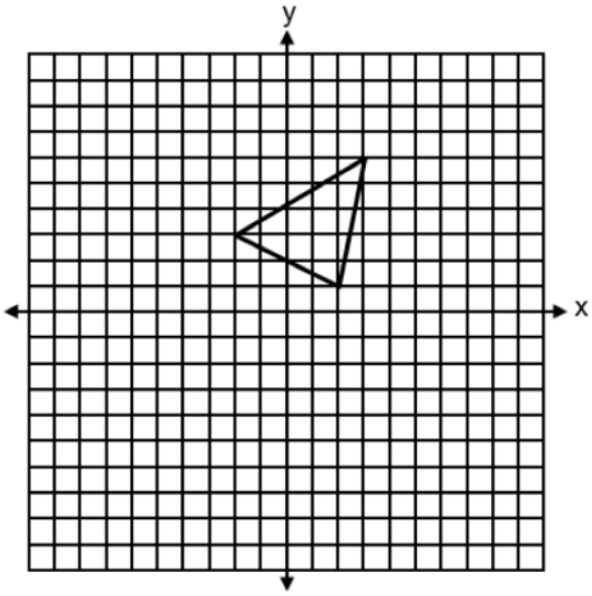
4 Circle P with center at $(3,2)$ and passing through $A(0,6)$ is graphed on the set of axes below.



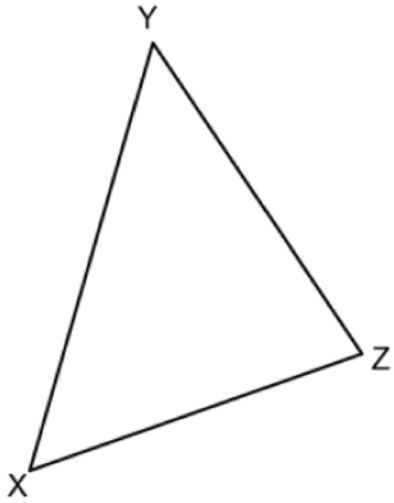
An equation of circle P is

1) $(x+3)^2+(y+2)^2=5$
2) $(x+3)^2+(y+2)^2=25$
3) $(x-3)^2+(y-2)^2=5$
4) $(x-3)^2+(y-2)^2=25$

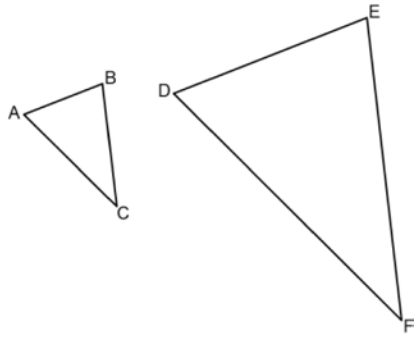
5 A triangle with vertices at $(-2,3)$, $(3,6)$, and $(2,1)$, is graphed on the set of axes below. A horizontal stretch of scale factor 2 with respect to $x = 0$, is represented by $(x,y) \rightarrow (2x,y)$. Graph the image of this triangle, after the horizontal stretch on the same set of axes.



6 Triangle XYZ is shown below. Using a compass and straightedge, construct the circumcenter of $\triangle XYZ$.

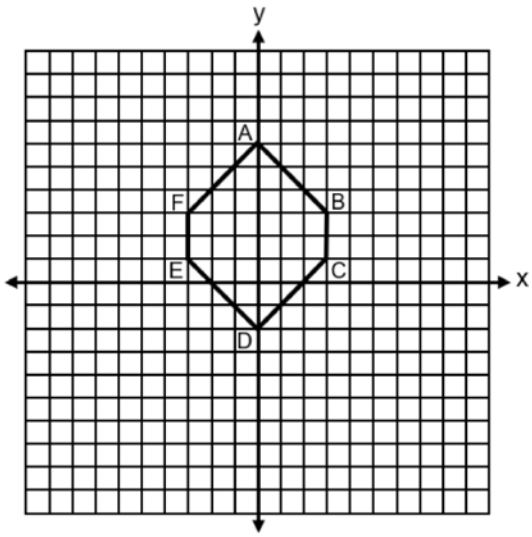


7 In the diagram below, $\triangle ABC \sim \triangle DEF$.



If $AB = 4$, $BC = x - 1$, $DE = x + 3$, and $EF = 15$, determine and state the length of $\overline{DE}$.

8 Hexagon $ABCDEF$ with coordinates at $A(0,6)$, $B(3,3)$, $C(3,1)$, $D(0,-2)$, $E(-3,1)$, and $F(-3,3)$ is graphed on the set of axes below.



Determine and state the perimeter of $ABCDEF$ in simplest radical form.

2024 Geometry Sample Items
Answer Section

1 ANS: 2 PTS: 2 REF: spr2401geo NAT: G.CO.A.2
TOP: Identifying Transformations

2 ANS: 3

$$\frac{6\sqrt{3}}{x} = \frac{\sqrt{3}}{2}$$

$$x = 12$$

PTS: 2 REF: spr2402geo NAT: G.SRT.C.8 TOP: 30-60-90 Triangles

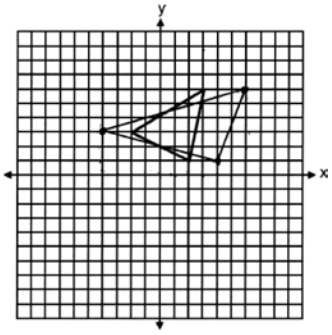
3 ANS: 2

$$K = \frac{1}{2}(8)(5)\sin 57 \approx 16.8$$

PTS: 2 REF: spr2403geo NAT: G.SRT.D.9 TOP: Using Trigonometry to Find Area
KEY: basic

4 ANS: 4 PTS: 2 REF: spr2404geo NAT: G.GPE.A.1
TOP: Equations of Circles KEY: write equation, given graph

5 ANS:



PTS: 2 REF: spr2405geo NAT: G.CO.A.2
TOP: Analytical Representations of Transformations KEY: graphics

6 ANS:

PTS: 2 REF: spr2406geo NAT: G.CO.D.12 TOP: Constructions
KEY: line bisector

7 ANS:

$$\frac{4}{x+3} = \frac{x-1}{15} \quad 7+3=10$$

$$x^2 - x + 3x - 3 = 60$$

$$x^2 + 2x - 63 = 0$$

$$(x+9)(x-7) = 0$$

$$x = 7$$

PTS: 4 REF: spr2407geo NAT: G.SRT.B.5 TOP: Similarity
KEY: basic

8 ANS:

$$4\sqrt{3^2+3^2} + 2(2) = 4\sqrt{18} + 4 = 12\sqrt{2} + 4$$

PTS: 2 REF: spr2408geo NAT: G.GPE.B.7 TOP: Polygons in the Coordinate Plane