

Designs in the Coordinate Plane Table of Contents

Note: The letters and numbers in parentheses following the activity name reference specific Common Core State Standards for Mathematics addressed by the activity

- 1. Activity 1 Hexagon**
Addition & Subtraction of Two Integers (6.NS 8, 7.NS 3)
- 3. Activity 2 Eight-Pointed Star**
Addition & Subtraction of Two Integers (6.NS 8, 7.NS 3)
- 5. Activity 3 Three Dimensional Block**
Order of Operations Using Signed Numbers (6.NS 8, 7.NS 3)
- 7. Activity 4 Line Design of a Parabola**
Solving Equations (6.NS 8, 8.G 3, A-APR 1)
- 9. Activity 5 The Tribar Impossible Design**
Evaluating Algebraic Expressions (6.NS 8, 8.G 3, A-APR 1)
- 11. Activity 6 Three Pronged Connector Impossible Design**
Two Simultaneous Linear Equations (6.NS 8, 8.EE 8, A-REI 6)
- 13. Activity 7 Eight-Pointed Stars**
Order of Operations with Signed Numbers (6.NS 8, 7.NS 3, 8.G 3)
- 15. Activity 8 Symmetrical Design, Extended by Properties of Symmetry**
Addition & Subtraction with Three Integers (6.NS 8, 7.NS 3, 8.G 3)
- 17. Activity 9 Symmetrical Design, Extended by Properties of Symmetry**
Order of Operations with Integers (6.NS 8, 7.NS 3, 8.G 3)
- 19. Activity 10 Hexagon, Extended by Properties of Symmetry**
Square Roots & Absolute Values (6.NS 8, 7.NS 3, 8.G 3)
- 21. Activity 11 Symmetrical Octagon**
Two Simultaneous Linear Equations (6.NS 8, 8.G 3, 8.EE 8, A-REI 6)
- 23. Activity 12 Tessellated Triangles**
Word Problems Relating x and y (6.NS 8, 7.EE 4, 8.G 3)
- 25. Activity 13 Four Parabolas in a Square**
Solving Equations (6.NS 8, 8.G 3, A-APR 1)
- 27. Activity 14 Symmetrical Design, Extended by Properties of Symmetry**
Evaluating Algebraic Expressions (6.NS 8, 8.G 3, A-APR 1)
- 29. Activity 15 Star-Shaped Design, Extended Twice by Properties of Symmetry**
Solving Equations (6.NS 8, 8.G 3, A-APR 1)
- 31. Activity 16 Symmetrical Design, Extended by Properties of Symmetry**
Missing Terms in Sequences (6.NS 8, 8.G 3)
- 33. Activity 17 Dodecagon**
Proportions (6.NS 8)
- 35. Activity 18 Stylistic Star Design**
Addition & Subtraction with Fractions (6.NS 8, 8.G 3, A-APR 1)
- 37. Activity 19 Eight-Pointed Star Design**
Evaluating Algebraic Expressions (6.NS 8, 8.G 3, A-APR 1)
- 39. Activity 20 Symmetrical Design, Extended Twice by Properties of Symmetry**
Solving Equations (6.NS 8, 8.G 3, A-APR 1)
- 41. Activity 21 Block Design, Extended by Properties of Symmetry**
Order of Operations (6.NS 8, 7.NS 3, 8.G 3)
- 43. Activity 22 Line Design of Two Parabolas**
Adding Signed Numbers, Square Roots, Absolute Values (6.NS 8, 7.NS 3, 8.G 3)
- 45. Activity 23 Eight-Pointed Star Design**
Word Problems Relating x and y (6.NS 8, 7.EE 4, 8.G 3)
- 47. Activity 24 Octagonal Design**
Word Problems Relating x and y (6.NS 8, 7.EE 4, 8.G 3)
- 49. Activity 25 Line Design of Cardioid**
Following Directions (6.NS 8)
- 51. Answer Key**
- 53. Notes to Teacher**
- 56. Sample Overhead Design**
- 57. Extra Grids**

Solve for x in each equation. Then use the value of x and the given value of y to form an ordered pair of numbers (x,y) .

x	y	
$x + 2 = -3$	5	A (_____ , 5)
$2x - 6 = -14$	5	B (_____ , 5)
$2x = -3 + x$	5	C (_____ , 5)
$2x - 10 = -14$	5	D (_____ , 5)
$4x = x - 3$	5	E (_____ , 5)
$2x - 6 = x - 6$	5	F (_____ , 5)
$3x - 4 = -1$	5	G (_____ , 5)
$2x - 5 = x - 3$	5	H (_____ , 5)
$3x = 3 + 2x$	5	I (_____ , 5)
$4x - 5 = 3x - 1$	5	J (_____ , 5)
$2 - 2x = 7 - 3x$	5	K (_____ , 5)
$4x + 2 = -3 + 3x$	4	L (_____ , 4)
$3x + 4 = 2x - 1$	3	M (_____ , 3)
$3x - 1 = -6 + 2x$	2	N (_____ , 2)
$4 - 2x = -1 - 3x$	1	O (_____ , 1)
$x - 3x = -(5 + 3x)$	0	P (_____ , 0)
$3x - 1 = 9 + x$	4	Q (_____ , 4)
$3x - 12 = x - 2$	3	R (_____ , 3)
$x + 2 - 3x = 5 - 3x + 2$	2	S (_____ , 2)
$6x - 2 = 3 + 5x$	1	T (_____ , 1)
$3x - 2 = -5 + 4x - 2$	0	U (_____ , 0)

Locate the ordered number pairs as points in the coordinate plane and label each point with its corresponding letter.

Draw segments \overline{AP} , \overline{AK} , \overline{KU} .

Draw segments \overline{AQ} , \overline{BR} , \overline{CS} , \overline{DT} , \overline{EU} .

Draw segments \overline{KL} , \overline{JM} , \overline{IN} , \overline{HO} , \overline{GP} .

Activity 13

The design you have drawn is symmetrical with the Y axis as the axis of symmetry. Now, draw another symmetrical design with the X axis as the axis of symmetry. For example, $A_1(-5, -5)$ is the mirror image of A, and $Q_1(5, -4)$ is the mirror image of Q.

Draw segment $\overline{A_1Q_1}$ which is the mirror image of \overline{AQ} , $\overline{B_1R_1}$ which is the mirror image of \overline{BR} , and so on.

