

**LESSON 44** .....

1.  $2\sqrt{3} - 3\sqrt{3} = -\sqrt{3}$
2.  $\frac{5}{\sqrt{5}} = \frac{5}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{5\sqrt{5}}{5} = \sqrt{5}$   
 $\sqrt{5} + \sqrt{45} = \sqrt{5} + 3\sqrt{5} = 4\sqrt{5}$
3.  $2x - 6 = 3x + 5$   
 $-x = 11$   
 $x = -11$
4.  $x^2 + 2x = 6$   
 $x^2 + 2x + 1 = 6 + 1$   
 $(x + 1)^2 = 7$   
 $x + 1 = \pm\sqrt{7}$   
 $x = -1 \pm \sqrt{7}$
5. eq1 + eq2  
 $5x = 5$   
 $x = 1$   
 $2(1) + y = 7$   
 $y = 5$   
 Solution: (1, 5)
6. eq1  $\times$  2 - eq2  
 $13y = 26$   
 $y = 2$   
 $2x + 5(2) = 10$   
 $x = 0$   
 Solution: (0, 2)
7.  $y - 2 = -2(x - 3)$   
 $y - 2 = -2x + 6$   
 $y = -2x + 8$
8.  $m = \frac{-4 - 5}{0 - 1} = 9$   
 $b = -4$   
 $y = 9x - 4$
9.  $A, P,$  and  $B$  are collinear.  $C, P,$  and  $D$  are collinear.
10. true; See Postulate 7.2.
11.  $AB = 2AP$   
 $5x + 13 = 2(x + 5)$   
 $3x = -3$   
 $x = -1$   
 $\rightarrow BP = AP = -1 + 5 = 4$   
 $AB = 2AP = 2(4) = 8$
12. supplementary angles  
 $(4x + 5) + 3x = 180$   
 $7x = 175$   
 $x = 25$
13. vertical angles  
 $3x + 2 = 101$   
 $3x = 99$   
 $x = 33$
14. vertical angles  
 $a = 113$
- corresponding angles  
 $b = 113$
15. alternate exterior angles  
 $3a = 93$   
 $a = 31$
- supplementary angles  
 $3a + b = 180$   
 $b = 87$
16.  $\triangle$  angle sum = 180  
 $38 + 70 + (x - 29) = 180$   
 $x = 101$
17. interior angle sum =  $180(n - 2) = 180(5 - 2) = 540^\circ$   
 $90 + 2x + 102 + 78 = 540$   
 $x = 135$
18. interior angle =  $180(6 - 2)/6 = 120^\circ$   
 exterior angle =  $360/6 = 60^\circ$

19. The angle sum of a regular polygon is equal to one interior angle multiplied by the number of angles, and the number of angles is equal to the number of sides. Let  $n$  be the number of sides. Then  $180(n - 2) = 108n$ . Solve for  $n$  to get  $n = 5$ . So, the polygon has 5 sides.
20. An equilateral triangle has 3 lines of symmetry, and its angle of rotational symmetry is  $360/3 = 120^\circ$ .
21.  $(x, y) \rightarrow (x + 3, y - 7)$       22.  $B(-4, 5) \rightarrow B'(-4, -5)$
23.  $C(1, -8) \rightarrow P'(8, 1)$       24. scale factor = 4
25. a rotation of  $180^\circ$  about the origin; A composition of reflections over two intersecting lines is a rotation.
26. a reflection over the  $x$ -axis and then a translation of 2 units left
27. a dilation about the origin by scale factor  $1/2$  and then a reflection over the  $x$ -axis
28. translation
29. The intercepts are at  $(-1, 0)$  and  $(0, 1)$ . These are translated to  $(-1, 3)$  and  $(0, 4)$ , then reflected to  $(1, 3)$  and  $(0, 4)$ . The slope-intercept equation of a line passing through  $(1, 3)$  and  $(0, 4)$  is  $y = -x + 4$ .