

Supplement #1
Completing the Square & Circles

1. $x^2 + 12x + \underline{\hspace{2cm}}$

$(x + \underline{\hspace{2cm}})^2$

2. $x^2 - 4x + \underline{\hspace{2cm}}$

$(x - \underline{\hspace{2cm}})^2$

3. $a^2 - 10a + \underline{\hspace{2cm}}$

$(a - \underline{\hspace{2cm}})^2$

4. $x^2 + 5x + \underline{\hspace{2cm}}$

$(x + \underline{\hspace{2cm}})^2$

5. $y^2 - 7y + \underline{\hspace{2cm}}$

$(y - \underline{\hspace{2cm}})^2$

6. $x^2 + 6x + \underline{\hspace{2cm}}$

$(x + \underline{\hspace{2cm}})^2$

7. $x^2 - 2x + \underline{\hspace{2cm}}$

$(x - \underline{\hspace{2cm}})^2$

8. $a^2 - 8a + \underline{\hspace{2cm}}$

$(a - \underline{\hspace{2cm}})^2$

9. $x^2 + 3x + \underline{\hspace{2cm}}$

$(x + \underline{\hspace{2cm}})^2$

10. $y^2 - y + \underline{\hspace{2cm}}$

$(y - \underline{\hspace{2cm}})^2$

11. $z^2 - 14z + \underline{\hspace{2cm}}$

$(z - \underline{\hspace{2cm}})^2$

12. $w^2 + 18w + \underline{\hspace{2cm}}$

$(w + \underline{\hspace{2cm}})^2$

13. $q^2 - 22q + \underline{\hspace{2cm}}$

$(q - \underline{\hspace{2cm}})^2$

14. $t^2 + 9t + \underline{\hspace{2cm}}$

$(t + \underline{\hspace{2cm}})^2$

15. $x^2 - 11x + \underline{\hspace{2cm}}$

$(x - \underline{\hspace{2cm}})^2$

16. $r^2 - 16r + \underline{\hspace{2cm}}$

$(r - \underline{\hspace{2cm}})^2$

17. $x^2 + 20x + \underline{\hspace{2cm}}$

$(x + \underline{\hspace{2cm}})^2$

18. $p^2 - 24p + \underline{\hspace{2cm}}$

$(p - \underline{\hspace{2cm}})^2$

Determine the equation of the circle in standard form:

19. Center (2 , 1): Radius 2

20. Center $\left(\frac{5}{2}, 2\right)$: Radius $\frac{3}{2}$

21. Center (1 , -3): Radius 7

22. Center (0 , 8): Radius $\sqrt{3}$

23. Center (-1 , 0): Radius $\frac{1}{2}$

24. Center (-4 , 2): Radius $2\sqrt{5}$

Determine the center and radius of the circle:

25. $(x - 1)^2 + (y + 1)^2 = 1$

26. $(x - 4)^2 + (y + 3)^2 = 25$

27. $(x + 2)^2 + (y - 4)^2 = 5$

28. $(x + 1)^2 + y^2 = 49$

29. $x^2 + (y - 2)^2 = 16$

30. $x^2 + y^2 = 0$

Determine the center, radius, x- intercept(s) and y-intercept(s) of the circle:

31. $x^2 + y^2 - 2x + 2y + 1 = 0$

32. $x^2 + y^2 - 8x + 6y = 0$

33. $x^2 + y^2 + 4x - 4y - 1 = 0$

34. $x^2 + y^2 - 2x + 4y - 4 = 0$

35. $x^2 + y^2 - 6x + 2y + 9 = 0$

36. $x^2 + y^2 + 4x + 2y - 20 = 0$

37. $x^2 + y^2 - x + 2y + 1 = 0$

38. $x^2 + y^2 - 6x + 4y - 12 = 0$

Answers

1. 6, 36
2. 2, 4
3. 5, 25
4. $\frac{5}{2}, \frac{25}{4}$
5. $\frac{7}{2}, \frac{49}{4}$
6. 3, 9
7. 1, 1
8. 4, 16
9. $\frac{3}{2}, \frac{9}{4}$
10. $\frac{1}{2}, \frac{1}{4}$
11. 7, 49
12. 9, 81
13. 11, 121
14. $\frac{9}{2}, \frac{81}{4}$
15. $\frac{11}{2}, \frac{121}{4}$
16. 8, 64
17. 10, 100
18. 12, 144
19. $(x - 2)^2 + (y - 1)^2 = 4$
20. $(x - \frac{5}{2})^2 + (y - 2)^2 = \frac{9}{4}$
21. $(x - 1)^2 + (y + 3)^2 = 49$
22. $x^2 + (y - 8)^2 = 3$
23. $(x + 1)^2 + y^2 = \frac{1}{4}$
24. $(x + 4)^2 + (y - 2)^2 = 20$
25. Center (1, -1): Radius 1
26. Center (4, -3): Radius 5
27. Center (-2, 4): Radius $\sqrt{5}$
28. Center (-1, 0): Radius 7
29. Center (0, 2): Radius 4
30. Center (0, 0): Radius 0
i.e. The Origin (a single point)
31. Center (1, -1): Radius 1 Y.I.: (0, -1) X.I.: (1, 0)
32. Center (4, -3): Radius 5 Y.I.: (0, -6) & (0, 0) X.I.: (8, 0) & (0, 0)
33. Center (-2, 2): Radius 3 Y.I.: $(0, 2 \pm \sqrt{5})$ X.I.: $(-2 \pm \sqrt{5}, 0)$
34. Center (1, -2): Radius 3 Y.I.: $(0, -2 \pm 2\sqrt{2})$ X.I.: $(1 \pm \sqrt{5}, 0)$
35. Center (3, -1): Radius 1 Y.I.: DNE X.I.: (0, 3)
36. Center (-2, -1): Radius 5 Y.I.: $(0, -1 \pm \sqrt{21})$ X.I.: $(-2 \pm 2\sqrt{6}, 0)$
37. Center ($\frac{1}{2}$, -1): Radius $\frac{1}{2}$ Y.I.: (0, -1) X.I.: DNE
38. Center (3, -2): Radius 5 Y.I.: (0, 2) & (0, -6) X.I.: $(3 \pm \sqrt{21}, 0)$