

10.8 Answers

13. $\frac{(x-0)^2 + (y-0)^2}{x^2 + y^2} = 4^2$

14. $\frac{(x-0)^2 + (y-1)^2}{(x-0)^2 + (y-1)^2} = 7^2$
 $\frac{(x-0)^2 + (y-1)^2}{(x-0)^2 + (y-1)^2} = 49$

15. $\frac{(x+2)^2 + (y-0)^2}{(x+2)^2 + y^2} = 8^2$ $r = \frac{10}{2} = 5$

16. $\frac{(x-8)^2 + (y+9)^2}{(x-8)^2 + (y+9)^2} = \frac{11^2}{11^2}$

17. $r = \sqrt{(-2-0)^2 + (0-0)^2}$
 $r = \sqrt{(-2)^2} = \sqrt{4} = 2$

$\frac{(x+2)^2 + (y-0)^2}{(x+2)^2 + (y-0)^2} = \frac{3^2}{9}$
 $\frac{(x+2)^2 + (y-0)^2}{(x+2)^2 + (y-0)^2} = 9$

18. $r = \sqrt{(-1-2)^2 + (-2-4)^2}$
 $r = \sqrt{(-3)^2 + (-6)^2} = \sqrt{9+36} = \sqrt{45} = 3\sqrt{5}$

$\frac{(x-1)^2 + (y+2)^2}{(x-1)^2 + (y+2)^2} = \frac{\sqrt{8}^2}{8}$

19. $r = 3$, center $(-5, -1)$

$(x+5)^2 + (y+1)^2 = 9$

20. $r = \sqrt{(0-3)^2 + (0-3)^2}$
 $r = \sqrt{3^2 + 3^2} = \sqrt{18+9} = \sqrt{27} = 3\sqrt{3}$
 center $(3, 3)$

$(x-3)^2 + (y-3)^2 = 18$

21. $15 \times 3 = 45 = r$
 center $(0, 0)$ $x^2 + y^2 = 2025$

22. center $(0, 20)$ $r = \frac{10}{2} = 5$

$x^2 + (y-20)^2 = 5^2$
 $x^2 + (y-20)^2 = 25$

23. center $(0, 0)$
 $r = \sqrt{3^2 + 0} = 3$

24. $x^2 - 4x + y^2 - 2y = -1$ complete the square
 $x^2 - 4x + 4 + y^2 - 2y + 1 = -1 + 4 + 1$ to put into standard form
 $(x-2)^2 + (y-1)^2 = 4$
 center $(2, 1)$
 radius $r = 2$

25. $x^2 + 8x + y^2 - 4y = 4$ to get $(\frac{1}{2})^2$
 $x^2 + 8x + 16 + y^2 - 4y + 4 = 4 + 16 + 4$
 $(x+4)^2 + (y-2)^2 = 24$
 center $(-4, 2)$
 radius $r = \sqrt{24} = 2\sqrt{6}$

29. $x^2 + (\frac{1}{2}x)^2 = 5$

$x^2 + \frac{1}{4}x^2 = 5$
 $\frac{5}{4}x^2 = 5$
 $x^2 = 4$
 $x = \pm 2$

$y = \frac{1}{2}(2) = 1$
 $y = \frac{1}{2}(-2) = -1$
 $(2, 1) + (-2, -1)$

30. $x^2 + (-x+2)^2 = 2$

$x^2 + x^2 - 4x + 4 = 2$
 $2x^2 - 4x + 2 = 0$
 $x^2 - 2x + 1 = 0$
 $(x-1)(x-1) = 0$
 $x-1 = 0$
 $x = 1$
 $y = -1+2 = 1$
 $(1, 1)$

31. $x^2 + (x-2)^2 = 8$

$x^2 + x^2 - 4x + 4 = 8$
 $2x^2 - 4x - 4 = 0$
 $x^2 - 2x - 2 = 0$
 $x = 2$
 $y = 2-2 = 0 \rightarrow (2, 0)$
 $y = -2-2 = -4 \rightarrow (-2, -4)$

32. $(x-3)^2 + (-3x)^2 = 25$
 $x^2 - 6x + 9 + 9x^2 = 25$
 $10x^2 - 6x - 16 = 0$
 $10x^2 + 6x - 16 = 0$

$-b \pm \sqrt{b^2 - 4ac} = -(-6) \pm \sqrt{(-6)^2 - 4(10)(-16)}$
 $\frac{6 \pm \sqrt{36 + 640}}{2(10)}$
 $= \frac{6 \pm \sqrt{676}}{20} = \frac{6 \pm 26}{20}$
 $\frac{6+26}{20} = 1.6$
 $\frac{6-26}{20} = -1.0$

$y = -3(1) = -3$ $(1, -3)$
 $y = -3(-1.0) = 3$ $(-1.0, 3)$

33. $x^2 + (3y)^2 = 5$
 $x^2 + 9y^2 = 5$
 $10x^2 = 5$
 $x^2 = \frac{1}{2}$
 $x = \pm \frac{1}{\sqrt{2}} = \pm \frac{\sqrt{2}}{2}$

$y = 3(\frac{\sqrt{2}}{2}) = \frac{3\sqrt{2}}{2}$ $(\frac{\sqrt{2}}{2}, \frac{3\sqrt{2}}{2})$
 $y = 3(-\frac{\sqrt{2}}{2}) = -\frac{3\sqrt{2}}{2}$ $(\frac{\sqrt{2}}{2}, -\frac{3\sqrt{2}}{2})$

34. $(x-1)^2 + (-x-3)^2 = 4$
 $x^2 - 2x + 1 + x^2 + 6x + 9 = 4$
 $2x^2 + 4x + 11 = 4$
 $2x^2 + 4x + 7 = 0$

$x = \frac{-4 \pm \sqrt{4^2 - 4(2)(7)}}{2(2)}$
 $= \frac{-4 \pm \sqrt{16 - 56}}{4}$
 $= \frac{-4 \pm \sqrt{-40}}{4}$ can't happen to
 no point of intersection

35. $d = \sqrt{(0-0)^2 + (-4-4)^2}$
 $= \sqrt{0^2 + (-8)^2}$
 $= \sqrt{64} = 8$
 $r = \frac{8}{2} = 4$

center $(\frac{0+0}{2}, \frac{4+4}{2}) = (0, 4)$

$\frac{5^2 - (x-2)^2 + y^2}{25 - (x-2)^2 + y^2} = \frac{1^2}{1}$

36. $r = \frac{2\sqrt{11}}{2} = \sqrt{11}$
 center $(-13, 0)$

$\frac{(x+13)^2 + (y-0)^2}{(x+13)^2 + (y-0)^2} = \frac{11^2}{11^2}$