

Practise, Apply, Solve 7.2U, page 581

1. (a) $x^2 + (y - 2)^2 = 16$ (b) $(x - 3)^2 + y^2 = 1$
 (c) $(x - 1)^2 + (y - 5)^2 = 81$ (d) $(x + 2)^2 + (y - 4)^2 = 64$
 (e) $(x + 2)^2 + (y + 5)^2 = 6$ (f) $(x - 4)^2 + (y + 6)^2 = 20$
2. (a) centre: (0, 0), radius: or $3\sqrt{2}$
 (b) centre: (2, 0), radius: 3
 (c) centre: (6, -8), radius: 9
 (d) centre: (-4, 3), radius: or $4\sqrt{2}$
 (e) centre: (5, 4), radius: or $3\sqrt{3}$
 (f) centre: (1, -6), radius: or $2\sqrt{10}$
3. (a) $(x - 3)^2 + (y - 2)^2 = 9$, original: centre (0, 0), radius of 3; new: centre (3, 2), radius 3
 (b) $(x + 4)^2 + (y + 3)^2 = 4$, original: centre (0, 0), radius of 2; new: centre (-4, -3), radius 2
 (c) $(x - 4)^2 + (y + 4)^2 = 1$, original: centre (0, 0), radius of 1; new: centre (4, -4), radius 1
 (d) $x^2 + y^2 = 9$, original: centre (2, 3), radius of 3; new: centre (0, 0), radius 3
 (e) $(x - 2)^2 + (y - 2)^2 = 9$, original: centre (-4, 5), radius of 3; new: centre (2, 2), radius 3
4. (a) standard form: $x^2 + y^2 = 25$, general form: $x^2 + y^2 - 25 = 0$
 (b) standard form: $(x - 1)^2 + (y - 4)^2 = 16$, general form: $x^2 + y^2 - 2x - 8y + 1 = 0$
 (c) standard form: $(x + 4)^2 + (y - 5)^2 = 1$, general form: $x^2 + y^2 + 8x - 10y + 40 = 0$
 (d) standard form: $(x + 2)^2 + (y - 3)^2 = 9$, general form: $x^2 + y^2 + 4x - 6y + 4 = 0$
5. (a) $(x + 4)^2 + (y + 3)^2 = 25$ (b) $(x - 2)^2 + (y + 1)^2 = 16$
 (c) $(x - 1)^2 + (y + 5)^2 = 4$ (d) $(x - 6)^2 + (y + 3)^2 = 49$
6. (a) centre (0, 2), radius: 2 (b) centre (0, 0), radius: 2
 (c) centre $\left(\frac{3}{2}, -1\right)$, radius: $\frac{\sqrt{11}}{2}$
 (d) centre (3, -1), radius: 3 (e) centre (4, -3), radius: 6
7. (a) $x^2 + y^2 = 4$ (b) $(x + 1)^2 + (y - 2)^2 = 9$
 (c) $x^2 + (y - 4)^2 = 5$ (d) $(x + 2)^2 + (y - 7)^2 = 24$
8. $(x + 3)^2 + (y - 4)^2 = 16$
9. The equations of the family of circles will all be of the form: $(x - a)^2 + (y - a)^2 = 64$. Graphically, the circles' centres will all be on the line $y = x$.
10. (a) $x^2 + (y - 6)^2 = 8$ (b) $(x - 2)^2 + (y + 2)^2 = 17$
 (c) $x^2 + y^2 = 64$ (d) $x^2 + (y - 2)^2 = 16$
 (e) $(x + 1)^2 + (y - 2)^2 = 20$
11. $x^2 + y^2 - 8x + 6y + 30 = 0$ is not a circle since the radius cannot be a negative number.
12. (a) semicircle above x-axis with centre at origin and radius 2
 (b) semicircle above x-axis with centre at origin and radius 3
 (c) semicircle below x-axis with centre at origin and radius 4
 (d) semicircle to right of y-axis with centre at origin and radius 3
 (e) semicircle above x-axis with centre (0, 2) and radius 3
 (f) semicircle with centre at (0, 3), radius 5, x-intercepts at 4 and -4
13. (a) $x^2 + y^2 = 25$ (b) $(x - 2)^2 + (y - 3)^2 = 20$
 (c) $x^2 + y^2 = 5$ (d) $(x + 1)^2 + y^2 = 17$
 (e) $(x - 8)^2 + (y - 2)^2 = 53$
14. 6 units
15. (a) Answers will vary. (b) $(x - 4)^2 + (y + 3)^2 = 12$
 (c) The standard form will give the centre and the radius of the circle.
16. (a) Yes, you can make a call using a cell phone because you are within reach of the second tower.
 (b) about 222.75 km² (c) 20.01 km
17. $(x \pm 8\sqrt{2})^2 + y^2 = 64$ and $x^2 + (y \pm 8\sqrt{2})^2 = 64$
18. $(x - 1)^2 + y^2 = 4$; circle with centre (1, 0) and radius 2.
19. semicircle above x-axis with centre at origin and radius 5
 (a) A(-5, 0), B(5, 0) (b) C(0, 5)
20. $(x, y) = (0.22, -1.66)$ and $(-2.22, 5.66)$