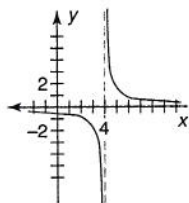


6. -25 7. -165
 9. $x^3 - 2x^2 - 5x + 6$ 10. $x^4 - 6x^3 + 6x^2 + 6x - 7$
 11. $2, \pm i$ 12. $-1, -1, \frac{3 \pm \sqrt{17}}{2}$
 13. $x^5 + 3x^4 - 6x^3 - 10x^2 + 21x - 9$
 14. $16x^5 - 8x^4 + 9x^3 - 9x^2 - 7x - 1$
15. $x^2 - (1 + 2i)x + (-1 + i)$
 16. $\frac{1}{2}, \frac{1}{2}$ 17. $1, -1 \pm i$
 18. $(x^2 - 4x + 5)(x - 2)$ 19. 2
 20. 1 21. none
 22. $1, 1, -1, -1, \frac{1}{2}$ 23. $\frac{2}{3}, -3, \pm i$

Chapter 5

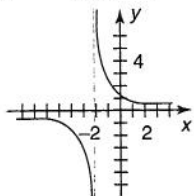
Exercise Set 5.1

1. domain: $\{x|x \neq 1\}$; intercepts: $(0, 0)$
 3. domain: $\{x|x \neq 0, 2\}$; intercepts: none
 5. domain: $\{x|x \text{ is real}\}$; intercepts: $(\pm\sqrt{3}, 0), (0, -1)$
 7. $x = 4, y = 0$



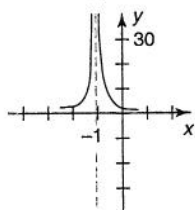
$XMIN = -5, XMAX = 10, XSCL = 1$
 $YMIN = -5, YMAX = 5, YSCL = 1$

9. $x = -2, y = 0$



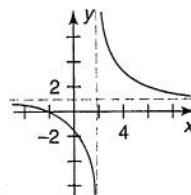
$XMIN = -6, XMAX = 4, XSCL = 1$
 $YMIN = -5, YMAX = 5, YSCL = 1$

11. $x = -1, y = 0$



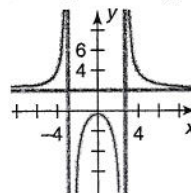
$XMIN = -6, XMAX = 4, XSCL = 1$
 $YMIN = -1, YMAX = 6, YSCL = 1$

13. $x = 2, y = 1$



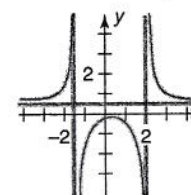
$XMIN = -10, XMAX = 10, XSCL = 1$
 $YMIN = -5, YMAX = 5, YSCL = 1$

15. $x = 2, x = -2, y = 2$



$XMIN = -10, XMAX = 10, XSCL = 1$
 $YMIN = -5, YMAX = 5, YSCL = 1$

17. $x = 2, x = -\frac{3}{2}, y = \frac{1}{2}$

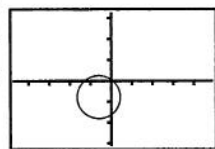


EQUAL viewing rectangle
 $XSCL = 1, YSCL = 1$

Exercise Set 5.2

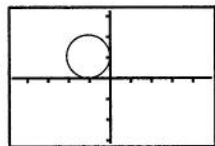
1. $(x - 2)^2 + (y - 3)^2 = 4$ 3. $(x + 2)^2 + (y + 3)^2 = 5$
 5. $x^2 + y^2 = 9$ 7. $(x + 1)^2 + (y - 4)^2 = 8$

9. $(h, k) = (2, 3); r = 4$



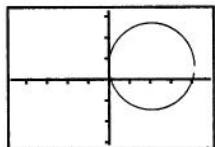
X and Y values are from 4 times the EQUAL viewing rectangle. XSCL = 4, YSCL = 4

11. $(h, k) = (2, -2); r = 2$



X and Y values are from 2 times the EQUAL viewing rectangle. XSCL = 2, YSCL = 2

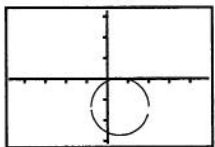
13. $(h, k) = (-4, -\frac{3}{2}); r = 3\sqrt{2}$



X and Y values are from 2 times the EQUAL viewing rectangle. XSCL = 2, YSCL = 2

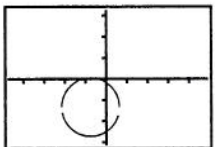
15. no graph

17. $(x + 2)^2 + (y - 4)^2 = 16; (h, k) = (-2, 4); r = 4$



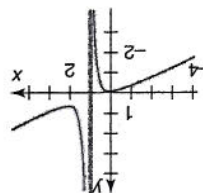
X and Y values are from 3 times the EQUAL viewing rectangle. XSCL = 3, YSCL = 3

19. $(x - \frac{3}{2})^2 + (y - \frac{2}{5})^2 = \frac{11}{2}; (h, k) = (\frac{3}{2}, \frac{2}{5}); r = \frac{\sqrt{22}}{2}$



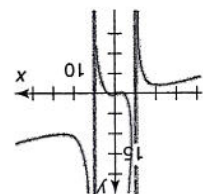
X and Y values are from 2 times the EQUAL viewing rectangle. XSCL = 2, YSCL = 2

19. $x = 1$



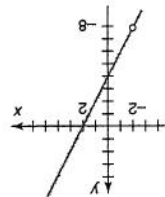
XMIN = -5, XMAX = 5, XSCL = 1
 YMIN = -3, YMAX = 3, YSCL = 1

21. $x = 5, x = -5$



XMIN = -10, XMAX = 15, XSCL = 5
 YMIN = -15, YMAX = 25, YSCL = 5

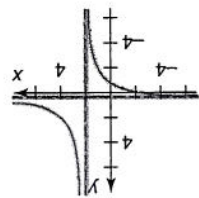
23. $x \neq -2$



XMIN and XMAX are from the EQUAL viewing rectangle.

gle. XSCL = 1
 YMIN = -10, YMAX = 5, YSCL = 1

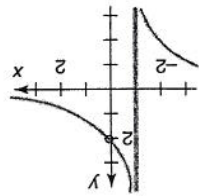
25. $x \neq 2$



XMIN and XMAX are from the EQUAL viewing rectangle.

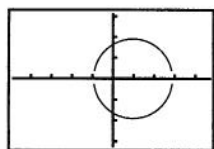
gle. XSCL = 5
 YMIN = -5, YMAX = 5, YSCL = 1

27. $x \neq 0, x \neq -1$



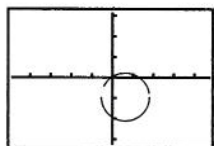
EQUAL viewing rectangle
 XSCL = 1, YSCL = 1

21. $(x - 1)^2 + y^2 = \frac{7}{2}$; $(h, k) = (1, 0)$; $r = \frac{\sqrt{14}}{2}$



X and Y are from the EQUAL viewing rectangle.
XSCL = 1, YSCL = 1

23. $(x - 2)^2 + (y + 3)^2 = 8$; $(h, k) = (2, -3)$; $r = 2\sqrt{2}$



X and Y are from 3 times the EQUAL viewing rectangle.
XSCL = 3, YSCL = 3

25. $(x - 3)^2 + (y + 4)^2 = 0$; point at $(3, -4)$

27. $(x + \frac{3}{2})^2 + (y - \frac{5}{2})^2 = \frac{3}{2}$; $(h, k) = (-\frac{3}{2}, \frac{5}{2})$; $r = \frac{\sqrt{6}}{2}$

29. $(x - 3)^2 + y^2 = 11$; $(h, k) = (3, 0)$; $r = \sqrt{11}$

31. $(x - \frac{3}{2})^2 + (y - 1)^2 = \frac{17}{4}$; $(h, k) = (\frac{3}{2}, 1)$; $r = \frac{\sqrt{17}}{2}$

33. $(x + 2)^2 + (y - \frac{2}{3})^2 = \frac{100}{9}$; $(h, k) = (-2, \frac{2}{3})$; $r = \frac{10}{3}$

35. neither 37. 9π

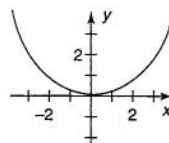
41. $(x + 5)^2 + (y - 2)^2 = 8$ 43. $(x - 5)^2 + (y - 1)^2 = 20$

45. The top and bottom “halves” of the circle do not necessarily form the entire circle when the “meeting points” are not plotted. In some cases, this can be avoided by choosing X values that are multiples of the EQUAL viewing rectangle. However, there is no way of defining the viewing rectangle to ensure that the top and bottom halves will always meet. (Consider $x^2 + y^2 = 7$.)

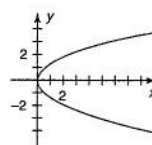
47. $x^2 + (y - 2)^2 = 1$, center; $(0, 2)$; radius: 1

Exercise Set 5.3

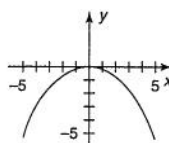
1. focus: $(0, 1)$; directrix: $y = -1$



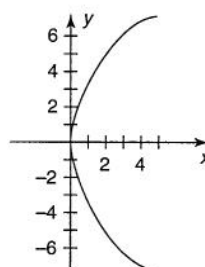
3. focus: $(\frac{1}{2}, 0)$; directrix: $x = -\frac{1}{2}$



5. focus: $(0, -\frac{5}{4})$; directrix: $y = \frac{5}{4}$



7. focus: $(3, 0)$; directrix: $x = -3$



9. $y^2 = 4x$

11. $y^2 = 6x$

13. $x^2 = -8y$

15. $y^2 = -5x$

17. $y^2 = -4x$

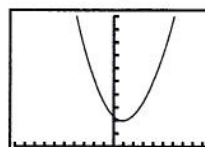
19. $y^2 = x$

21. downward

23. to the left

25. $(x - 1)^2 = 3(y - 2)$; vertex: $(1, 2)$; axis: $x = 1$;

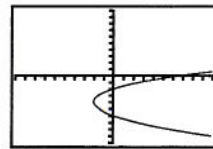
direction: up



$XMIN = -10, XMAX = 10, XSCL = 1$

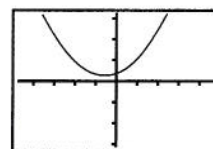
$YMIN = 0, YMAX = 10, YSCL = 1$

27. $(y - 4)^2 = -2(x - 2)$; vertex: $(2, 4)$; axis: $y = 4$;



direction: left

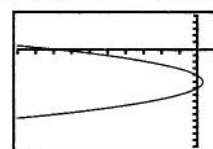
29. $(x - \frac{1}{2})^2 = -3(y + \frac{4}{1})$; vertex: $(\frac{1}{2}, -\frac{4}{1})$; axis: $x = \frac{1}{2}$;



direction: down

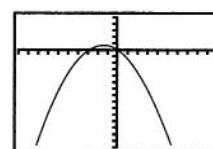
the default viewing window
XSCL = 1, YSCL = 1
EQUAL viewing rectangle

31. $(y - 5)^2 = 3(x + \frac{3}{1})$; vertex: $(-\frac{3}{1}, 5)$; axis: $y = 5$;



direction: right

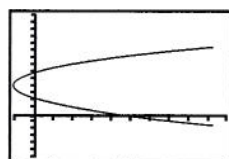
33. $(x - \frac{3}{2})^2 = 3(y + \frac{12}{5})$; vertex: $(\frac{3}{2}, -\frac{12}{5})$; axis: $x = \frac{3}{2}$;
XMIN = -1, XMAX = 10, XSCL = 1
YMIN = -5, YMAX = 15, YSCL = 1



direction: up

XMIN = -10, XMAX = 10, XSCL = 1
YMIN = -5, YMAX = 15, YSCL = 1

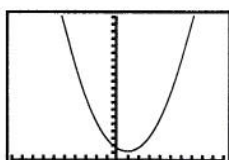
35. $(y + 3)^2 = -\frac{1}{2}(x - 4)$; vertex: $(4, -3)$; axis: $y = -3$;



direction: left

XMIN = -30, XMAX = 5, XSCL = 5
YMIN = -10, YMAX = 5, YSCL = 1

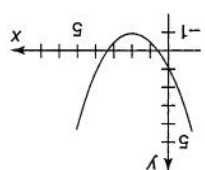
37. $(x + 1)^2 = -2(y + 1)$; vertex: $(-1, -1)$; axis: $x = -1$;



direction: down

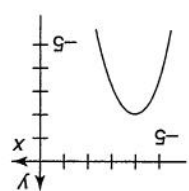
XMIN = -10, XMAX = 10, XSCL = 1
YMIN = -20, YMAX = 0, YSCL = 1

39. vertex: $(2, -1)$; axis: $x = 2$; direction: up



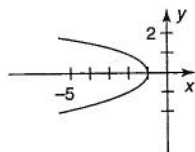
the default viewing window
XSCL = 1, YSCL = 1

41. vertex: $(-4, -2)$; axis: $x = -4$; direction: down



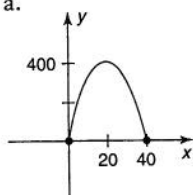
XMIN = -15, XMAX = 5, XSCL = 1
YMIN = -50, YMAX = 0, YSCL = 10

43. vertex: $(-1, 0)$; axis: $y = 0$; direction: left



$XMIN = -20, XMAX = 0, XSCL = 1$
 $YMIN = -10, YMAX = 10, YSCL = 1$

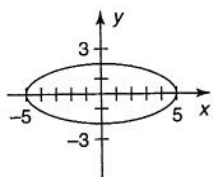
45. a. b. no



47. a. $20\sqrt{6}$ inches b. 31 inches

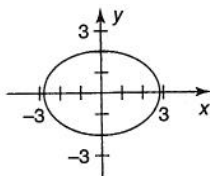
Exercise Set 5.4

1.



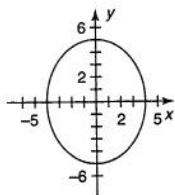
X and Y values are from 2 times
the EQUAL viewing rectangle
 $XSCL = 2, YSCL = 2$

3.



EQUAL viewing rectangle
 $XSCL = 2, YSCL = 2$

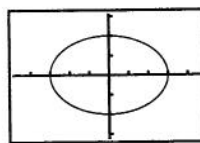
5.



X and Y values are from 2 times the EQUAL viewing
rectangle.

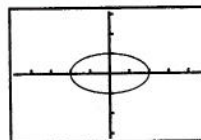
$XSCL = 2, YSCL = 2$

7. $\frac{x^2}{9} + \frac{y^2}{4} = 1; (0, \pm 2), (\pm 3, 0)$



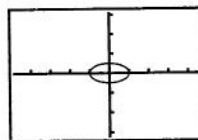
EQUAL viewing rectangle
 $XSCL = 1, YSCL = 1$

9. $\frac{x^2}{4} + \frac{y^2}{1} = 1; (0, \pm 1), (\pm 2, 0)$



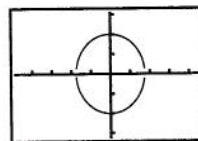
EQUAL viewing rectangle
 $XSCL = 1, YSCL = 1$

11. $\frac{x^2}{1} + \frac{y^2}{\frac{1}{4}} = 1; (0, \pm \frac{1}{2}), (\pm 1, 0)$



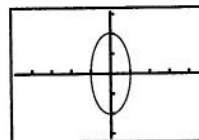
EQUAL viewing rectangle
 $XSCL = 1, YSCL = 1$

13. $\frac{x^2}{3} + \frac{y^2}{4} = 1; (0, \pm 2), (\pm\sqrt{3}, 0)$



EQUAL viewing rectangle
 $XSCL = 1, YSCL = 1$

15. $\frac{x^2}{\frac{1}{4}} + \frac{y^2}{\frac{9}{8}} = 1; (0, \pm \frac{3\sqrt{2}}{4}), (\pm \frac{1}{2}, 0)$



X and Y values are from .05 times the EQUAL viewing
rectangle.

$XSCL = 0.5, YSCL = 0.5$