Lesson 8.2.1

8-63. See below:

a. Square root

b. 2

c. 2

d. $\pm\sqrt{2}$, $\approx \pm 1.4142$

8-64. You need to take the square root of a negative number.

8-65. See below:

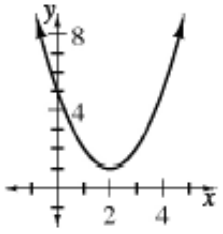
a. $2i$

b. $6i^2 = -6$

c. $4i^2 = -4$, $-4(-5i) = 20i$

d. $5i$

8-66. See graph below:

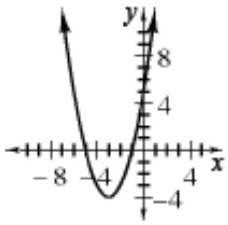


a. No

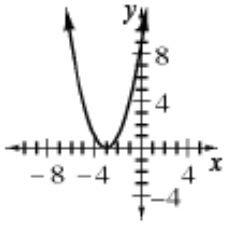
b. $x = 2 \pm i$

8-67. See below:

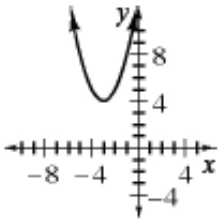
a. See graph below, -1 and -5



b. See graph at below. $x = -3$



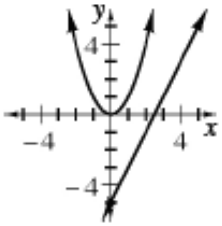
c. See graph below, No, because it does not cross the x-axis. $x = -3 \pm 2i$



d. If the graph crosses the x-axis, the equation has real roots. If the graph does not cross the x-axis, the equation has complex roots, and if the graph only touches the x-axis there is only one real root.

8-68. See below:

a. See graph below, the two graphs do not intersect.



b. $(1 + 2i, -3 + 4i)$, $(1 - 2i, -3 - 4i)$

c. This is purely speculative at this point. The point of the question is to wonder.

8-69. $\frac{1}{x} = -x + 1$ means $1 = -x^2 + x$, so $x^2 - x + 1 = 0$; this has complex roots, so the graphs do not intersect; $x = \frac{1 \pm i\sqrt{3}}{2}$.

8-70. See below:

a. $-18 - 5i$

b. $1 \pm 2i$

c. $5 + i\sqrt{6}$

8-71. $i^3 = i^2 i = -1i = -i$; 1

8-72. See below:

a. –21

b. $-10 + 7i$

c. $-22 + i$

8-73. Yes, substitute it into the equation to check.

8-74. $x = -8$

8-75. Yes; both are equivalent to $x^2 - 10x + 25$.

8-76. See below:

a. $7i$

b. $\sqrt{2}i$ or $i\sqrt{2}$

c. –16

d. $-27i$

8-77. See below:

a. $\frac{x+3}{2}$

b. $\sqrt{x-2}+3$

8-78. See below:

a. $x \approx 2.24$

b. $x \approx \pm 2.25$