8-29. If x represents time traveled (in hours) and y represents distance between the two trains, then $82x + 66x = y$. When $y = 111$, $x = 0.75$ hours, which is 45 minutes. So, the time when the trains are 111 miles apart is 4:10 p.m.

8-30. See below:

a. 9 units

b. 15 units

c. $\sqrt{10}$ units

d. 121 square units

8-31. See below:

a. $(k - 2)(k - 10)$

b. $(2x + 7)(3x - 2)$

c. $(x - 4)^2$

d. $(3m + 1)(3m - 1)$

e. The largest exponent in each expression is 2.

8-32. See below:

a. $\sqrt[3]{125}^2 = 25$

b. $\sqrt{16} = 4$

c. $\frac{1}{\sqrt{16}} = \frac{1}{4}$

d. $\sqrt[4]{\frac{1}{81}} = \frac{1}{3}$

8-33. See below:

a. $x = 5$

b. $x = -6$

c. $x = 5$ or -6

d. $x = -\frac{1}{4}$

e. $x = 8$

f. $x = -\frac{1}{4}$ or 8