

1.4 In-class Practice

1. Factor.

a) $x^2 + 1$

b) $x^2 + 4$

2. Solve.

a) $x^{-2/3} + x^{-1/3} - 6 = 0$

b) $10x^{-2} + 33x^{-1} - 7 = 0$

c) $6(x + 2)^4 - 11(x + 2)^2 = -4$

d) $(x + 1)^{2/5} - 3(x + 1)^{1/5} + 2 = 0$

e) $x^{3/2} = 125$

f) $(x - 3)^{2/5} = 4$

g) $(2x + 5)^{1/3} - (6x - 1)^{1/3} = 0$

h) $\frac{4x+3}{x+1} + \frac{2}{x} = \frac{1}{x^2+x}$

i) $\frac{-x}{x+1} + \frac{1}{1-x} = \frac{-2}{x^2-1}$

j) $\sqrt{3x} = \sqrt{5x+1} - 1$

k) $\sqrt{2x+5} - \sqrt{x+2} = 1$

l) $\sqrt{2\sqrt{7x+2}} = \sqrt{3x+2}$

3. **Number of Bus Passengers** A charter bus company charges a fare of \$40 per person, plus \$2 per person for each unsold seat on the bus. If the bus holds 100 passengers and x represents the number of unsold seats, how many passengers must ride the bus to produce revenue of \$5950? (*Note: Because of the company's commitment to efficient fuel use, the charter will not run unless filled to at least half-capacity.*)

4. **Harvesting a Cherry Orchard** The manager of a cherry orchard wants to schedule the annual harvest. If the cherries are picked now, the average yield per tree will be 100 lb, and the cherries can be sold for 40 cents per pound. Past experience shows that the yield per tree will increase about 5 lb per week, while the price will decrease about 2 cents per pound per week. How many weeks should the manager wait to get an average revenue of \$38.40 per tree?

5. **Filling a Settling Pond** A sewage treatment plant has two inlet pipes to its settling pond. One pipe can fill the pond 3 times as fast as the other pipe, and together they can fill the pond in 12 hr. How long will it take the faster pipe to fill the pond alone?

6. **Speed of an Excursion Boat** An excursion boat travels upriver to a landing and then returns to its starting point. The trip upriver takes 1.2 hr, and the trip back takes 0.9 hr. If the average speed on the return trip is 5 mph faster than on the trip upriver, what is the boat's speed upriver?

7. **Dimensions of a Square** If the length of each side of a square is decreased by 4 in., the perimeter of the new square is 10 in. more than half the perimeter of the original square. What are the dimensions of the original square?

8. **Kitchen Flooring** Paula plans to replace the vinyl floor covering in her 10-ft by 12-ft kitchen. She wants to have a border of even width of a special material. She can afford only 21 ft² of this material. How wide a border can she have?

