50. Solving for r we have $r = \dfrac{s}{\theta}$, so the radius of the circle is $r = \dfrac{3}{25^\circ \cdot \frac{\pi}{180^\circ}} = 3 \cdot \frac{36}{5\pi} \approx 6.88$ ft.

52. Since the diameter is 30 in, we have $r = 15$ in. In one revolution, the arc length (distance traveled) is $s = \theta r = 2\pi \cdot 15 = 30\pi$ in. The total distance traveled is 1 mi $\cdot$ 5280 ft/mi $\cdot$ 12 in/ft = 63,360 in $= 63{,}360 \text{ in} \cdot \frac{1 \text{ rev}}{30\pi \text{ in}} \approx 672.27$ rev. Therefore the car wheel will make approximately 672 revolutions.

54. $\theta = 35^\circ - 30^\circ = 5^\circ = 5^\circ \cdot \frac{\pi}{180^\circ}$ rad $= \frac{\pi}{36}$ rad. Then using the formula $s = \theta r$, the length of the arc is $s = \frac{\pi}{36} \cdot 3960 = 110\pi \approx 345.575$. So the distance between the two cities is roughly 346 mi.

56. Since the sun is so far away we can assume that the rays of the sun are parallel when striking the earth, thus the angle formed at the center of the earth is also $\theta = 7.2^\circ$. So $r = \frac{s}{\theta} = \dfrac{500}{7.2^\circ \cdot \frac{\pi}{180^\circ}}$ $= \frac{180 \cdot 500}{7.2\pi} \approx 3980$ mi, and the circumference is $c = 2\pi r = \frac{2\pi \cdot 180 \cdot 500}{7.2\pi} = 25{,}000$ mi.

58. (a) $A = \frac{1}{2} r^2 \theta = \frac{1}{2} \cdot 8^2 \cdot 80^\circ \cdot \frac{\pi}{180^\circ} = 32 \cdot \frac{4\pi}{9} = \frac{128\pi}{9} \approx 35.45$

(b) $A = \frac{1}{2} r^2 \theta = \frac{1}{2} \cdot 10^2 \cdot 0.5 = 25$

60. $\theta = 60^\circ = 60^\circ \cdot \frac{\pi}{180^\circ} = \frac{\pi}{3}$ rad. Then $A = \frac{1}{2} r^2 \theta = \frac{1}{2} \cdot 3^2 \cdot \frac{\pi}{3} = \frac{3\pi}{2} \approx 4.7 \text{ mi}^2$

62. $r = 24$ mi, $A = 288 \text{ mi}^2$. Then $\theta = \frac{2A}{r^2} = \frac{2 \cdot 288}{24^2} = 1 \text{ rad} \approx 57.3^\circ$