NAME _____ **DATE** _____

Module 18   Solving Radical Equations
Lesson 3   Solving Problems Using Radical Equations

additional practice

Solve. Find answers rounded to the nearest tenth.

1. The radius r of a circle can be found by $r = \sqrt{\frac{A}{\pi}}$ when A is the area of the circle. Find the radius of a circle whose area is 6 in^2.

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2. Use the formula $r = \sqrt{\frac{A}{\pi}}$ to find the approximate area of a circle whose radius is 25 ft.

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3. The speed of a roller coaster in a loop can be modeled by the equation $s = 8\sqrt{h - 2r}$ where s is the speed of the coaster, h is the coaster's height, and r is the radius of the loop. An amusement park is building a new roller coaster. They want the roller coaster to have a speed of 32 ft/s at a certain point in a loop of radius 22 ft. How high is the coaster at this point in the loop?

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4. The amusement park is also considering a second set of plans which include a loop that is 68 ft high at a certain point. At this point, the roller coaster is moving at 38 ft/s. Use the formula $s = 8\sqrt{h - 2r}$ to find radius of the loop.

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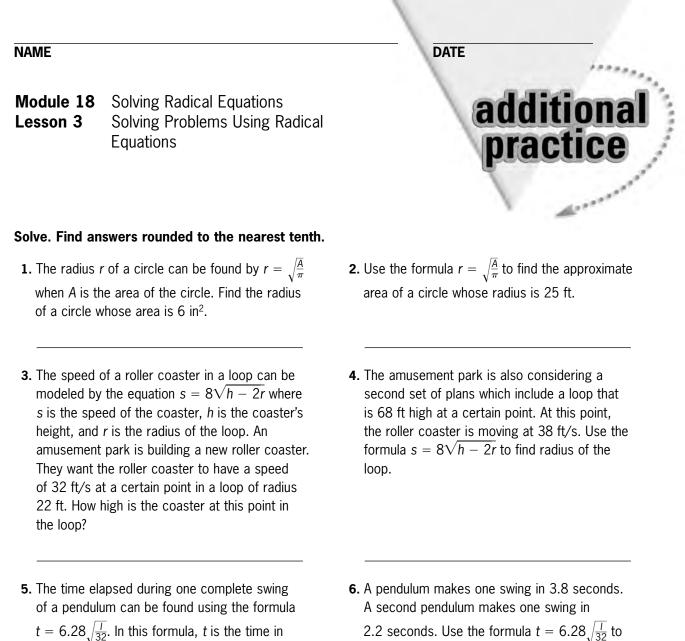**5.** The time elapsed during one complete swing of a pendulum can be found using the formula $t = 6.28\sqrt{\frac{l}{32}}$. In this formula, t is the time in seconds, and l is the length in feet of the pendulum. What is the length of a pendulum that makes one swing in 3.6 seconds?

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6. A pendulum makes one swing in 3.8 seconds. A second pendulum makes one swing in 2.2 seconds. Use the formula $t = 6.28\sqrt{\frac{l}{32}}$ to find how much longer the first pendulum is than the second pendulum?

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7. Use the formula $v = 20\sqrt{t + 273}$. In this formula, v is the speed of sound in meters per second, and t is the air temperature in degrees Celsius. What is the air temperature when the speed of sound is 280 meters per second?

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8. Use the formula $v = 20\sqrt{t + 273}$ to find the air temperature of the speed of sound if 347 meters per second.

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9. The formula $V = 3.5\sqrt{h}$ relates height and distance, where h is height in meters above ground and V is the distance in kilometers a person can see to the horizon. If Jonathan can see 4.5 km, how tall is he?

10. Use the formula $V = 3.5\sqrt{h}$ to find how high from the ground Missy would need to be in order to see the horizon 6 km away.

11. Under certain conditions, an equation relating a car's speed and the length in feet of a skid mark is given by $s = 5.5\sqrt{0.75m}$, where s is the speed when the car goes into a skid and m is the length of the skid mark. Find the length of a skid mark when a car goes into a skid at 58 miles per hour.

12. When Andrew skidded off the road into the ditch, he told the police officer he had been traveling at no more than 45 miles per hour. Use the formula $s = 5.5\sqrt{0.75m}$ to determine the length of his skid mark at this speed?

13. The formula $T = \sqrt{\frac{2\pi^2 r}{F}}$ gives the time T in seconds it takes a body with a mass 0.5 kg to complete one orbit of radius r meters. The force F pulls the body toward the center of the orbit. If it takes eight seconds for a body with a radius of 1.5 m to complete one revolution, find the force in Newtons acting on the body.

14. An object is acting with a gravitational force of 2.4 Newtons on two separate bodies. The body completes one revolution in 10 seconds. Find the radius of the body using the formula $T = \sqrt{\frac{2\pi^2 r}{F}}$.

15. The time T in seconds it takes for an object to fall a given distance in feet d can be found using the formula $T = \sqrt{\frac{d}{16}}$. An object is dropped from a bridge and hits the water 2.6 seconds later. How far did the object fall?

16. A paratrooper jumps from an airplane at 5,000 ft. If she freefalls for 15 seconds, how high will she be above the ground when she opens her parachute? Use the formula $T = \sqrt{\frac{d}{16}}$.

17. A right triangle has a leg which measures 14 inches and a hypotenuse measuring 50 inches. Find the length of the other leg.

18. A right triangle has legs which measure 11 cm and 60 cm. Find the length of the hypotenuse.

19. Celina walks six blocks due west and then, turns and walks eight blocks due south. How far is she from her point of origin?

20. Robby rides his bicycle from his house four miles due north and then, turns and rides due east to reach the park. The distance of a straight line from Robby's house to the park is five miles. How much further did he have to ride by taking this path?

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