

NAME _____

DATE _____

Module Test **A**

Module 18

Solve.

- | | |
|--|--|
| 1. $\sqrt{t} = 4$ $t = 16$ | 2. $-\sqrt{h} = 6$ no solution |
| 3. $\sqrt{x} = \frac{2}{3}$ $x = \frac{4}{9}$ | 4. $-\sqrt{x} = -0.5$ $x = 0.25$ |
| 5. $\sqrt[4]{x} = -2$ no solution | 6. $\sqrt[3]{x} = -2$ $x = -8$ |
| 7. $\sqrt[3]{b} = 3$ $b = 27$ | 8. $\sqrt[4]{t} = 1$ $t = 1$ |
| 9. $\sqrt{r} - 9 = 11$ $r = 400$ | 10. $\frac{\sqrt{j}}{-5} = -2$ $j = 100$ |
| 11. $\sqrt{5r} = 4$ $r = \frac{16}{5}$ | 12. $\sqrt{p - 9} = -4$ no solution |
| 13. $\sqrt{5x + 6} = 1$ $x = -1$ | 14. $\sqrt[3]{8t} = 4$ $t = 8$ |
| 15. $\sqrt[3]{f} - 1 = \frac{1}{2}$ $f = \frac{27}{8}$ | 16. $\frac{4\sqrt{m+1}}{5} = 8$ $m = 99$ |

Choose the letter of the correct answer.

17. A police officer used the formula $s = 5.5\sqrt{0.75m}$ to determine a car was going 79 mph when it went into a skid. What was the approximate length of the skid marks? (In the formula, s is the car's speed in mph, and m is the length of the skid mark in feet).
- a. about 42 feet b. about 155 feet
 c. about 275 feet d. about 367 feet
18. A wire runs from the top of a 24-foot telephone pole to a point on the ground seven feet from the base of the pole. How long is the wire? (Use the formula $c = \sqrt{a^2 + b^2}$, where c is the length of the hypotenuse of a right triangle, and a and b are the lengths of its legs.)
- a. 17 feet b. 23 feet
 c. 25 feet d. 31 feet

Complete each statement.

19. The distance between the points (x_1, y_1) and (x_2, y_2) can be found using the formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

20. The midpoint of the segment with endpoints at (x_1, y_1) and (x_2, y_2) can be found using

$$\text{the formula } m = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

21. An **extraneous** solution is one that is produced using valid operations on a radical equation, but that is not a solution to the original equation.

Solve each problem.

22. A jet is located 16 miles east and four miles north of an airport runway. At the same time, an airliner is located one mile west and two miles north of the same runway. What is the distance between the two aircraft?

The jet and airliner are $\sqrt{293}$ or approximately 17 miles apart.

23. A fast food chain is opening a new franchise at a location halfway between two existing locations. Currently, there is a restaurant located three miles west and nine miles north of company headquarters, and another located three miles east and three miles south of company headquarters. Relative to the location of company headquarters, what will be the location of the new restaurant?

The new restaurant will be located three miles north of company headquarters.

24. Circle A has a diameter with endpoints at $(-3, 2)$ and $(5, 0)$. Circle B has a diameter with endpoints at $(-6, -2)$ and $(4, 4)$. What is the distance between the center of Circle A and the center of Circle B?

- a. Explain the steps needed to solve the problem.

First, find the center of each circle using the midpoint formula. Then,

use the distance formula to find the distance between the centers.

- b. Solve the problem.

Center of Circle A is at $\left(\frac{-3 + 5}{2}, \frac{2 + 0}{2}\right)$, or $(1, 1)$.

Center of Circle B is at $\left(\frac{-6 + 4}{2}, \frac{-2 + 4}{2}\right)$, or $(-1, 1)$.

The distance from $(1, 1)$ to $(-1, 1)$ is $\sqrt{(-1 - 1)^2 + (1 - 1)^2} = \sqrt{4 + 0} = 2$.

25. Give an example of a radical equation that has no solution.

Possible answer: $\sqrt{x} = -10$.