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Unit 10 - Radical Expressions and Equations Review Guide

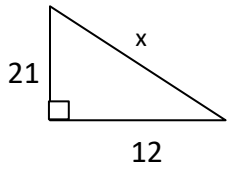
Use the Pythagorean Theorem to find the length of the missing third side.

1. $a = 6 \quad b = 9 \quad c = ?$

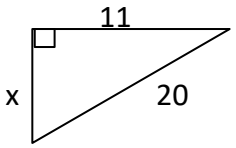
2. $c = 12 \quad b = 6 \quad a = ?$

In the following triangles, find the length of the unknown sides.

3.



4.



Determine whether each set of numbers form a Pythagorean triple.

5. $(6, 8, 10)$

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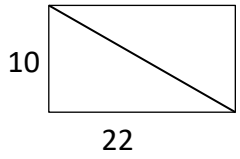
Determine whether the following side measures form right triangle.

6. $(10, 11, 20)$

Find the distance between the point at $(2, -4)$ and $(-1, 6)$.

7. (x_1, y_1) (x_2, y_2) $d = ?$
$(2, -4)$ $(-1, 6)$

8. A rectangle has a width of 10 and a length of 22. How long is the diagonal of the rectangle?



Write each expression in radical form.

9. $z^{\frac{2}{5}} =$

10. $(2x - 3)^{\frac{5}{4}} =$

Write each expression in exponential form.

11. $\sqrt[4]{x^3} =$

12. $\sqrt{(5 + 2y)} =$

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Simplify the following expressions. Assume that all variables represent positive real numbers.

13. $\sqrt[4]{625} =$

14. $\sqrt{49x^6y^2} =$

15. $\sqrt{80} =$

16. $\sqrt[4]{\frac{112x^5}{y^4}} =$

17. $\frac{1}{\sqrt{7}} =$

18. $\frac{1}{\sqrt[3]{2}} =$

Simplify radicals and recognize like or unlike radicals.

19. $5\sqrt{7}; \quad 7\sqrt{5}\,;$

20. $3\sqrt{6}; \quad \sqrt{24}$

Simplify the following expressions.

21. $\left(\sqrt[5]{-243}\right)^2 =$

22. $\sqrt[3]{\sqrt{a^2y^3}} =$

Add, subtract and simplify the following expressions. Assume that all variables represent positive real numbers.

23. $\sqrt{5} + \sqrt{125} - 5\sqrt{20} =$

24. $\sqrt{200} - \sqrt{18} - \sqrt{50} =$

Multiply and simplify the following expressions. Assume that all variables represent positive real numbers.

25. $\sqrt{2}\left(\sqrt{5} - \sqrt{2}\right) =$

26 $\sqrt{ab}\left(\sqrt{ab^2} - \sqrt{ab}\right) =$

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27. $(\sqrt{3}+\sqrt{2})(\sqrt{2}-\sqrt{5})=$

28. $(x+\sqrt{x})(\sqrt{x}-1)=$

Simplify the following expressions. Assume that all variables represent positive real numbers.

29. $\sqrt{2}*\sqrt[3]{3}=$

30. $\dfrac{2}{2-\sqrt{2}}=$

31. $\dfrac{1+\sqrt{x}}{1-\sqrt{x}}=$

Solve the following radical equation.

32. $\sqrt{y+3}=11$

Checking solution:

33. $\sqrt{10-x}=\sqrt{x-1}$

Checking solution:

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34. $\sqrt{2x-2}+6=2$ Checking solution:

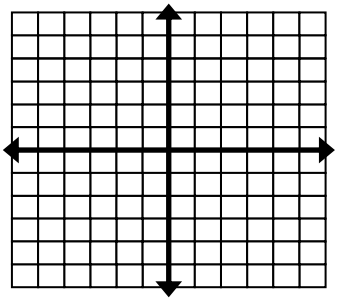
Identify the domain and range of each function.

35. $y=\sqrt{x-11}$ **Domain** **Range**

36. $y=\sqrt{x}+8$ **Domain** **Range**

Graph square root function

37. $y=\sqrt{x-3}$



Use the description to write the square root function $g(x)$.

38. The parent function $f(x)=\sqrt{x}$ is reflected across the x-axis, and translated up 4 units.

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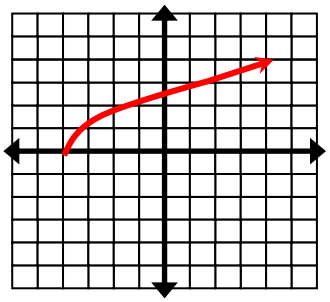
Use the graph shown as a guide, write the equation and describe the transformation.

39.



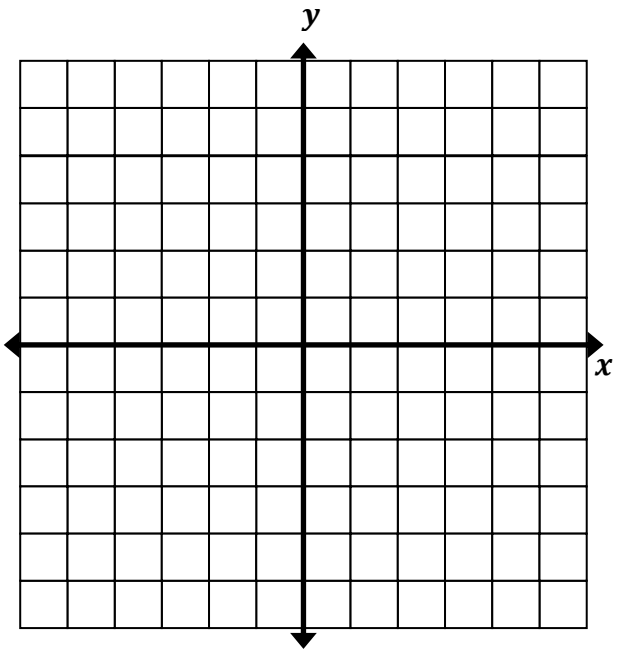
Graph function and identify its domain and range.

40. $y = \sqrt{x+1}$

1.
2. Table

x	y

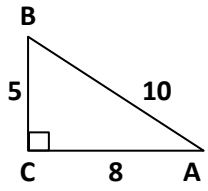
3. Graph



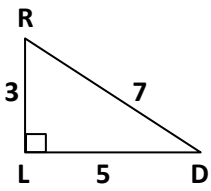
4. Domain Range

Find the value of each ratio.

41. $sin\angle B = ?$



42. $cos\angle D = ?$



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Use your calculator to calculate the following (correct to 2 decimal places).

43. $\boldsymbol{sin\ 37° =}$

44. $\boldsymbol{cos\ 12° =}$

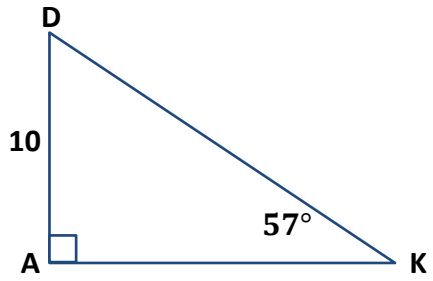
Use your calculator to calculate the following.

45. $\boldsymbol{sin\ \angle B = 0.6428}$ $\boldsymbol{\angle B =}$

46. $\boldsymbol{cos\ \angle K = 0.4226}$ $\boldsymbol{\angle K =}$

Use trigonometric ratios and Pythagorean Theorem to find the values of missing sides and angles.

47.



$\boldsymbol{\overline{DA} = 10}$ $\boldsymbol{\angle K = 57°}$

$\boldsymbol{\overline{AK}} =?$ $\boldsymbol{\angle D} = ?$

$\boldsymbol{\overline{DK}} =?$

Find the value of α that makes each statement true.

48. $\boldsymbol{sin\alpha = cos(3\alpha + 54°)}$

49. $\boldsymbol{cos\alpha = sin(\alpha - 60°)}$

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50. Andy walked 10 miles at an angle of $11°$ north of due east. To the nearest tenth of a mile, how far east, *x*, is Andy from his starting point?

51. A damaged tree is supported by a guy wire 15 meters long. The wire makes an angle of $60°$ with the ground. Calculate the height at which the guy wire is attached to the tree.