Name _____ Date _____ Class _____

TEKS 2A.9.A

LESSON 8-7

Problem Solving

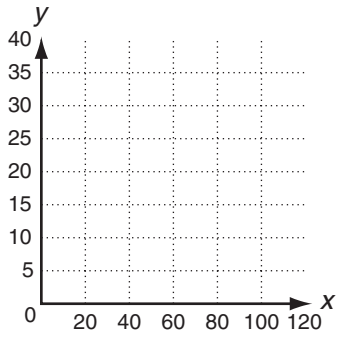
Radical Functions

On Earth the distance, *d*, in kilometers that one can see to the horizon is a function of altitude, *a,* in meters, and can be found using the function $d(a) = 3.56\sqrt{a}$. To find the corresponding distance to the horizon on Mars, the function must be stretched horizontally by a factor of about $\frac{9}{5}$.

1. a. Write the function that corresponds to the given transformation.

_____

b. Use a graphing calculator to graph the function and the parent function. Sketch both curves on the coordinate plane.



c. Use your graph to determine the approximate distance to the horizon from an altitude of 100 meters:

on Earth _____

on Mars _____

Choose the letter for the best answer.

2. Which equation represents the radius of a sphere as a function of the volume of the sphere?

A $r = \sqrt[3]{\frac{3\pi}{4V}}$ **C** $r = \sqrt[3]{\frac{4V}{3\pi}}$

B $r = \sqrt[3]{\frac{3V}{4\pi}}$ **D** $r = \sqrt[3]{\frac{4\pi}{3V}}$

3. Alice graphed a function that is found only in the first quadrant. Which function could she have used?

A $f(x) = \sqrt{x + 2}$ **C** $f(x) = \sqrt{x} + 2$

B $f(x) = -\sqrt{x}$ **D** $f(x) = \sqrt{x - 2}$

4. Harry made a symmetrical design by graphing four functions, one in each quadrant. The graph of which function is in the third quadrant?

A $f(x) = 4\sqrt{x}$ **C** $f(x) = -4\sqrt{x}$

B $f(x) = 4\sqrt{-x}$ **D** $f(x) = -4\sqrt{-x}$

5. The side length of a cube can be represented by $s = \sqrt{\frac{T}{6}}$, where T is the surface area of the cube. What transformation is shown by $s = \sqrt{\frac{T}{3}}$?

A Horizontal compression by a factor of 0.5

B Horizontal stretch by a factor of 2

C Vertical compression by a factor of 0.5

D Vertical stretch by a factor of 2

6. The hypotenuse of a right isosceles triangle can be written $H = \sqrt{2x^2}$, where x is the length of one of the legs. Which function models the hypotenuse when the legs are lengthened by a factor of 2?

A $H = \sqrt{2x^2} + 2$ **C** $H = \sqrt{4x^2}$

B $H = \sqrt{2x^2} + 4$ **D** $H = \sqrt{8x^2}$

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Radical Functions

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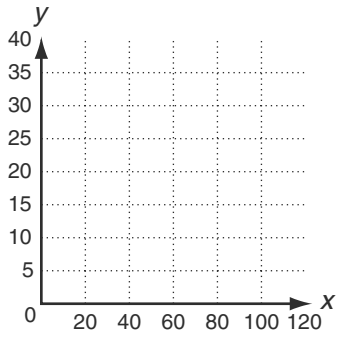
1. a. Write the function that corresponds to the given transformation.

$$d(a) = 3.56\sqrt{\frac{5}{9}a}$$

b. Use a graphing calculator to graph the function and the parent function. Sketch both curves on the coordinate plane.



c. Use your graph to determine the approximate distance to the horizon from an altitude of 100 meters:

on Earth 36 km

on Mars 27 km

Choose the letter for the best answer.

2. Which equation represents the radius of a sphere as a function of the volume of the sphere?

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