

GEOMETRY

The 4 E's

EMPOWER

Mattel plans to create an action figure of Joe Stud who is 6 feet tall with a 40-inch chest. If the doll will be 10 inches tall and proportional to Joe, how big should the doll's chest be?

ENHANCE

A cube is painted orange then cut twice in all three dimensions (like a Rubik's cube), then dropped. Of all the little cubes that are now on the floor, how many are painted on . . . 1 face, 2 faces, 3 faces, 4 faces, 0 faces?

EXPOSE

You have a 20' x 20' covered patio in which you plan to lay outdoor carpeting. Carpet comes in 12' wide rolls, and is sold for \$3 a square yard. How long must the roll be so that you have just enough to cover the patio floor, and how much will it cost?

ENRICH

A string is wrapped around the earth's equator. One meter is then added to the string, and the string is lifted equidistant from the earth's surface (assume a sphere). How high will the string be from the surface of the earth?

ALGEBRA

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EMPOWER

You drive 300 miles in 5 hours. How long will it take you to complete the entire trip of 1,020 miles?

ENHANCE

A number is divided by a quantity four less than itself, represented by the expression below. Which values of x will result in a quantity less than one? Greater than one? Which values of x cannot be used at all, and why?

$$\frac{x}{x-4}$$

EXPOSE

Talk-a-Lot cell phone service offers a monthly plan of \$2 basic rate, plus 5 cents per minute. Talk-some-More offers a monthly plan of \$5 basic rate, but only 3 cents per minute. Which plan is the least expensive?

ENRICH

The approximate distance that an object travels after being dropped is represented by the following equation $d = 5t^2$. What does this imply about the speed at which the object is falling?

Math Studies

The 4 E's

EMPOWER

A jar has 6 red marbles and 4 green marbles. What is the probability that by drawing two marbles, at least one of them will be green?

ENHANCE

Give a counterexample to the following statement:

If a person is a boy, then the person is blonde.

EXPOSE

The temperature at which water freezes is 0°C or 32°F . The temperature at which water boils is 100°C or 212°F . What is the temperature in $^{\circ}\text{F}$ at 20°C ?

ENRICH

The height of a toy rocket launched from the ground after a given time is $H(t) = 32t - 16t^2$. When will the rocket return to the ground?