Drill Problem #1

Function Name: quad

Inputs:

1. (*double*) The coefficient A of a quadratic polynomial.
2. (*double*) The coefficient B of a quadratic polynomial.
3. (*double*) The coefficient C of a quadratic polynomial.

Outputs:

1. (*double*) The positive root of the polynomial.
2. (*double*) The negative root of the polynomial.

Function Description:

Write a MATLAB function to evaluate the two roots of a quadratic polynomial. In terms of the coefficients A, B, and C, the positive are negative roots are given by:

$$positive\ root = \frac{-B + \sqrt{B^2 - 4AC}}{2A}$$

$$negative\ root = \frac{-B - \sqrt{B^2 - 4AC}}{2A}$$

Notes:

- The terms “positive root” and “negative root” only refer to which sign is used in the quadratic formula, and do not indicate the sign of each root. Do not worry if your “positive root” output is a negative number, or vice versa.

Homework 2: Functions

Drill Problem #2

Function Name: f

Inputs:

1. (*double*) An x-value at which to evaluate $f(x)$.

Outputs:

1. (*double*) The y-value of $f(x)$ evaluated for the given input.

Function Description:

Write a function in MATLAB to evaluate the function, $f(x)$, shown below, for any x-value:

$$f(x) = \frac{1.17\sqrt{1 + x^{0.9}} + \sinh(x^2 - 4)}{1.6487\exp(x^2 - g(x))}$$

Where $g(x)$ is another function of x, given by:

$$g(x) = x * |x|$$

Notes:

- "sinh" is hyperbolic sin. There is a built-in function in Matlab for it.
- $\exp(\,)$ is the exponential of whatever is contained within the parentheses, and there is also a built-in Matlab function for this.

Hints:

- A helper function could be useful for $g(x)$.

Drill Problem #3

Function Name: dormTape

Inputs:

1. (*double*) The total number of blocks to tape over.
2. (*double*) The fractions of blocks to be old gold.
3. (*double*) The fraction of blocks to be white.
4. (*double*) The fraction of blocks to be navy blue.
5. (*double*) The number of blocks one roll of tape can cover.

Outputs:

1. (*double*) The total cost of the project.

Function Description:

You've officially moved into your new dorm, and notice that the off-white painted cinderblock walls are pretty bland. So you decide to spruce things up a little bit by covering different blocks in the wall with different color tape to make a nice geometric pattern! You want to do your pattern in old-gold, white, and navy, and you've already figured out what design you're going to make with the tape, and how many blocks to cover with each color, but now you need to figure out how much this whole thing is going to cost you.

Using the total number of blocks to tape over, the respective fractions of blocks to be each color, the number of blocks that one roll of tape can cover, and the prices of each color tape shown below, your function should output the total cost of buying all of the tape for this project.

Color of Tape	**Price per Roll**
Old Gold	$4.99
White	$2.99
Navy	$3.99

Your function should also take account for an 8% sales tax, which should be calculated using the subtotal cost. You should then round your final output to the nearest cent (or hundredths decimal place).

Hints:

- You're not able to buy partial rolls of tape, so keep that in mind.