

## CALCULATOR APPLICATIONS TIPS (SEPTEMBER 2023)

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1. Calculate the geometric mean of the first ten prime numbers.

$$1 = \underline{\hspace{4cm}}$$

$$\sqrt[10]{(2)(3)(5)(7)(11)(13)(17)(19)(23)(29)} = 9.57$$

Answer: 9.57

2. Calculate how many different two digit numbers that can be created from the single digit odd numbers if repetition can be allowed.

$$2 = \underline{\hspace{4cm}} \text{ INT}$$

Single digit odd numbers are 1, 3, 5, 7 and 9.

$$\text{Solution: } (5)(5) = 25.0$$

Answer: 25 (INTEGER)

3. Calculate the final temperature when 2.29 grams of water at 48.9° C mixes with 3.65 grams of water at 36.1° C.

$$3 = \underline{\hspace{4cm}} \text{ } ^\circ\text{C}$$

$$\text{Solution: } \frac{(2.29)(48.9) + (3.65)(36.1)}{2.29 + 3.65} = 41.0$$

Answer: 41.0

4. Find the longest side of a 3x, 5x and 7x triangle whose area 0.0768.

$$4 = \underline{\hspace{4cm}}$$

Heron's formula: Area =  $\frac{\sqrt{s(s-a)(s-b)(s-c)}}{2}$ , where s =  
Semi-perimeter =  $(a + b + c)/2$ .

$$S = (3x + 5x + 7x)/2 = (15x)/2 = 7.5x$$

$$\text{Area} = \sqrt{(7.5x)(7.5x - 3x)(7.5x - 5x)(7.5x - 7x)}$$

$$.0768 = \sqrt{(7.5x)(4.5x)(2.5x)(.5x)}$$

$$.0768 = \sqrt{(7.5)(4.5)(2.5)(.5)x^4}$$

To eliminate the square root symbol, square both sides of the equation.

$$.0768^2 = (7.5)(4.5)(2.5)(.5)x^4$$

$$x^4 = \frac{.0768^2}{(7.5)(4.5)(2.5)(.5)}$$

$$x = \sqrt[4]{\frac{.0768^2}{(7.5)(4.5)(2.5)(.5)}}$$

$$\text{The longest side} = 7x = 7\sqrt[4]{\frac{.0768^2}{(7.5)(4.5)(2.5)(.5)}} = .761$$

Answer: .761

5. Find the length of the longest diagonal of a regular pentagon with side 231.

$$5 = \underline{\hspace{10em}}$$

Rule:  $\frac{\text{side}}{2 \sin\left(\frac{90}{n}\right)}$ , where n is the number of sides of the polygon

$$\text{Length of longest diagonal} = \frac{231}{2 \sin\left(\frac{90}{5}\right)} = 374$$

Answer: 374