

A calorimeter contains 20.0 mL of water at 15.0 °C . When 1.50 g of X (a substance with a molar mass of 76.0 g/mol) is added, it dissolves via the reaction $X(s)+H_2O(l)\rightarrow X(aq)$ and the temperature of the solution increases to 25.0 °C . Calculate the enthalpy change, ΔH , for this reaction per mole of X. Assume that the specific heat of the resulting solution is equal to that of water [4.18 J/(g·°C)], that density of water is 1.00 g/mL, and that no heat is lost to the calorimeter itself, nor to the surroundings.

Answer:

$$\Delta H(\text{mix}) = 42.3 \text{ KJ/mole}$$

Explanation:

$$\Delta H = (mc\Delta T)_{\text{water}} / \text{moles X}$$

$$m = \text{mass(g)} = 20 \text{ ml} \times 1.00 \text{ g/ml} = 20 \text{ g}$$

$$c = 4.184 \text{ J/g}\cdot\text{C}$$

$$\Delta T = 25^\circ\text{C} - 15^\circ\text{C} = 10^\circ\text{C}$$

$$\text{moles X} = (1.5 \text{ g}) / (76 \text{ g/mole}) = 0.0197 \text{ mole X}$$

$$\Delta H = (20 \text{ g})(4.184 \text{ J/g}\cdot\text{C})(10^\circ\text{C}) / (0.0197 \text{ mole X}) = 42,300 \text{ J/mole} = 42.3 \text{ KJ/mole} \text{ (3 sig. figs.)}$$

True or false? Opinionated websites can still be credible.

Suppose that hot dogs come in packs of 9 and buns come in packs of 12 . kareem bought the same number of hot dogs as buns. it was the least number of each

for which this was possible.

Find the two numbers the question is it in between then estimate the quotient $48 \div 7$

If the simple interest on \$2,000 for 2 year is \$320 then what is the interest rate

One sugar produced by photosynthesis is _____.

Marilyn bought 6 cans of tuna at \$1.29 a can. How much did she spend

1. Explain whether each of the following events increases or decreases the money supply. a. The Fed buys bonds in open-market operations. b. The Fed reduces the reserve requirement. c. The Fed increases the interest rate it pays on reserves. d. Citibank repays a loan it had previously taken from the Fed. e. After a rash of pickpocketing, people decide to hold less currency. f. Fearful of bank runs, bankers decide to hold more excess reserves. g. The FOMC increases its target for the federal funds rate.

Which of the following best describes physical development during adolescence? Puberty occurs according to a set schedule that is the same for all individuals.

The development of secondary sex characteristics happens at a rate unique to each individual.

The development of secondary sex characteristics begins at the same time for adolescents.

Individuals can expect few changes to their physical characteristics during adolescence.

Which phrase describes a possible intersection of a plane with a double cone? A. two lines

B. two points

C. two circles

D. two ellipses

A CSS style rule like `h1, h2 {color: red;}` will cause the color red to be applied to the text in both h1 and h2 elements. True False

Sarah and Patti, both middle school students, have been close friends since childhood. Lately Sarah has noticed some changes in Patti's behavior. She seems more withdrawn and moody. She is losing weight and her eating habits seem weird. For example, Patti eats an entire bowl of popcorn and a package of cookies when they watch a movie together at her house. Sarah has also noticed that Patti's eyes are often red and the knuckles on her fingers appear sore. What eating disorder matches Patti's symptoms?

Help! Prove the equality

$$\arccos \left(\frac{2}{3}\right) - \arccos \left(\frac{1+\sqrt{6}}{2\sqrt{3}}\right) = \frac{\pi}{6}$$

A car travels at 15 kilometers west in 10 minutes after reaching the destination the car travels back to the starting point again taking 5 minutes what is the average velocity of the car

How many times does 8 go into 18 in fractions

Formula is $(a^2+b^2)/ab+1$ Let a and b be positive integers such that $(ab+1)$ divides (a^2+b^2) . Show that $(a^2+b^2)/(ab+1)$ is the square of an integer.

When the Soviets blockaded Berlin, what was the response of the United States?

4. Which scenario describes eustress? (1 point) Your heart starts beating fast and you get very nervous when the news reports that your house is in the path of the tornado.

Your parents call to ask why your seven-year-old brother is not home yet and you realize you forgot to pick him up from school.

You are extremely nervous and start sweating while waiting in line for your name to be called to accept your high school diploma
You begin shivering while hiding in the bathroom of the grocery store hoping a robber does not realize you are there.
Who was named the ruler of India in 1857

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