

c241 Self Test

INSTRUCTIONS:

- *Finish the test before looking at the answers.*
 - *Give yourself 60 minutes to answer the Questions. If you cannot answer a question completely, write what you can. You should be able answer four of these questions (or come close).*
 - *Read the solutions and compare with your answers. You should be able to read and understand all the solutions. The technique used to solve the problem is more important than whether the final answer, is correct.*
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1. Without using a calculator, perform fractional arithmetic below, reducing your answer to lowest terms.

$$(a) \frac{420}{147} + \frac{35}{20} = \boxed{\frac{N}{M} ?}$$

$$(b) \frac{35}{726} \div \frac{20}{154} = \boxed{\frac{N}{M} ?}$$

SOLUTION

2. Is there any logical difference between the following two sentences?

(a) "If P then if Q then R ."

(b) "If P and Q then R ."

SOLUTION

3. Prove that $\frac{k(k+1)}{2} + k + 1 = \frac{(k+1)(k+2)}{2}$

SOLUTION

4. If you flip a coin, the outcome is either “heads” (H) or “tails” (T). Suppose you flip a coin seven times. One possibility is $H H H H H H H$; that is, all seven flips result in “heads.” How many possible outcomes are there in all?

SOLUTION

5. Simplify $\frac{6x^4 + 10x^3 + 26x^2 + 20x + 28}{2x^2 + 4}$

SOLUTION

6. A cafeteria offers a choice of 3 appetizers, 3 salads, 2 soups, 5 entrees, 2 desserts, and 4 drinks.
- (a) A *full meal* consists of an appetizer, either soup or a salad but not both, an entree, a dessert, and a drink. How many different full meals are there?
 - (b) A *quick meal* consists of either an appetizer or a soup and a salad but not both, an entree, and a drink. How many different quick meals are there?

SOLUTION

7. For what value or values of x is $2x^2 + x - 6 = 0$?

SOLUTION

8. Andy, Bob, Cindy, Dinah, Eve, Fred, and Gary live in the seven houses, numbered 1 through 7, on Maple Steet. Gary's address is 5 greater than Bob's. Bob's address is greater than Andy's. Dinah's address is less than Eve's, whose address is 2 less than Gary's. Cindy's address is less than either Dinah's or Fred's. Who lives where?

SOLUTION
