Activity Set 4.1 TI #6,7,8

Accuracy	Total
a) 4	4
b) 4	4
c) 4	4

6. *Math Concepts:* For the following questions, use specific prime number examples to help draw conclusions about the general statements.

a. If p is a prime number, how many factors does p^2 have? Explain whether or not the number of factors of p^2 varies with different primes.

b. If p is a prime number and n is a counting number, how many factors does p^n have?

c. Explain how you can use the results in part b to find a number with exactly 6 factors? Exactly 8 factors?

Accuracy	Total
a) 4	4
b) 4	4

7. *Math Concepts:*

a. The number 32 is the fifth power of 2, $32 = 2^5$, and it has exactly 6 factors. Is this true for the fifth power of any number? Are there any special conditions on the base number? Give three more numbers, like 32, that have exactly 6 factors. Explain your reasoning.

b. Each of the numbers 12, 18, and 20 also have exactly 6 factors. Looking at the factors for these numbers, determine what special characteristics these types of numbers with exactly 6 factors possess. List a few more numbers of this type with exactly 6 factors, and explain how you could generate more of these numbers with exactly 6 factors.

Accuracy	Total
a) 4	4
b) 4	4
c) 4	4
d) 4	4

8. *Math Concepts:* If p, q, and r, are three different prime numbers, determine the number of factors for each of the following numbers. Use specific prime number examples to help draw conclusions about the general statements.

a. $p \times q$

b. $p^2 \times q$

c. $p^2 \times q^2$

d. $p \times q \times r$