Math 1201 Roots and Powers Worksheet
Sec 3.1 and Sec 3.2

1a). List all the factors of 48. **1, 2, 3, 4, 6, 8, 12, 16, 24, 48**

b). What are the prime factors of 48? **2 and 3**

c). Write 48 as a product of its prime factors? **2 x 2 x 2 x 2 x 3 or 2^4 x 3**

d). Mary says the prime factorization for 48 is 4 x 4 x 3. Is Mary correct? Explain why or why not.

No, 4 is not a prime number, so it can be simplified further.

2. What is the difference between a multiple and a factor. Explain using examples.

Multiples of 10 = 10, 20, 30, 40, ... , etc.
Take the given number and multiply by 1,2,3, 4, ..., etc

Factors of 10 = 1, 2, 5, 10 Numbers that multiply together to give the product.

3. What is the greatest common factor, GCF, of 42 and 72? Use a method of your choice.

42: 1, 2, 3, 6, 7, 14, 21, 42 **GCF = 6**
72: 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72

4. Tyler determined the prime factorization for each of the following numbers:

20 = 2^2 x 5 45 = 3^2 x 5

What is the lowest common multiple, LCM, between 20 and 45?

2^2 x 3^2 x 5 = 4 x 9 x 5 = 180

5. What is the LCM of 60, 16 and 24? Use a method of your choice.

60 = 2^2 x 3 x 5 **LCM = 2^4 x 3 x 5 = 240**
16 = 2^4
24 = 2^3 x 3

6. Hot dog wieners come in packs of 8 and hot dog buns come in packs of 12. How many packs of each do you need to buy to have the same amount of each? Do you use GCF or LCM? Show workings.

Wieners: 8, 16, 24
Buns: 12, 24

3 pks of wieners and 2 pks of buns will give 24 of each.

7. One type of fabric is 150 cm long and another type is 132cm long. What are the longest possible equal cuts that you can make on both types so that you have no waste/leftovers. Do you use GCF or LCM? Show workings.

150 = 2 x 3 x 5 x 5
132 = 2 x 2 x 3 x 11

GCF = 6 cm longest equal cut

8. Evaluate each radical.

a). $\sqrt[3]{125}$ **= 5**

b). $\sqrt{144}$ **= 12**

c). $\sqrt[3]{512}$ **= 8**

9. Is 1728 a perfect square, a perfect cube or neither? Show your strategy.

1728 = 2 x 2 x 2 x 6 x 6 x 6 or (2 x 6) (2 x 6) (2 x 6)

There are 3 equal groups of 12.

1728 is a perfect cube. $\sqrt[3]{1728} = 12$

10. To determine the square root of 484, Colin completed the prime factorization as shown. However, Colin didn't finish the question. What is the square root of 484?

$$\sqrt{484}$$
$$= \sqrt{2 \times 242}$$
$$= \sqrt{2 \times 2 \times 121}$$
$$= \sqrt{2 \times 2 \times 11 \times 11}$$

Keep going $\sqrt{(2\times11)\times(2\times11)} = \sqrt{22\times22} = 22$

There are 2 equal groups of 22.

$\sqrt{484} = 22$