Math 10 **Unit 3 FACTORS AND PRODUCTS** **Name:** Key

Assignment: 3.1 **Date:**

1. List the first 6 multiples of each number.

a) 6: 6, 12, 18, 24, 30, 36

b) 13: 13, 26, 39, 52, 65, 78

c) 22: 22, 44, 66, 88, 110, 132

d) 31: 31, 62, 93, 124, 155, 186

e) 45: 45, 90, 135, 180, 225, 270

f) 27: 27, 54, 81, 108, 135, 162

2. List the prime factors of each number.

a) 40 $= 2^3 \cdot 5$

b) 75 $= 3 \cdot 5^2$

c) 81 $= 3^4$

d) 120 $= 2^3 \cdot 3 \cdot 5$

e) 140 $= 2^2 \cdot 5 \cdot 7$

f) 192 $= 2^6 \cdot 3$

3. Write each number as a product of its prime factors.

a) 45 $= 3^2 \cdot 5$

b) 80 $= 2^4 \cdot 5$

c) 96 $= 2^5 \cdot 3$

d) 122 $= 2 \cdot 61$

e) 160 $= 2^5 \cdot 5$

f) 195 $= 3 \cdot 5 \cdot 13$

4. Use powers to write each number as a product of its prime factors.

a) 600 $= 2^3 \cdot 3 \cdot 5^2$

b) 1150 $= 2 \cdot 5^2 \cdot 23$

c) 1022 $= 2 \cdot 7 \cdot 73$

d) 2250 $= 2 \cdot 3^2 \cdot 5^3$

e) 4500 $= 2^2 \cdot 3^2 \cdot 5^3$

f) 6125 $= 5^3 \cdot 7^2$

GCF

5. Determine the greatest common factor of each pair of numbers.

a) 46, 84

2 | 46, 84
23, 42

GCF = 2

b) 64, 120

4 | 64, 120
2 | 16, 30
8, 15

GCF = 8

c) 81, 216

9 | 81, 126
9, 14

GCF = 9

d) 180, 224

4 | 180, 224
45, 56

GCF = 4

e) 160, 672

4 | 160, 672
4 | 40, 168
2 | 10, 42
5, 21

GCF = 32

f) 220, 860

10 | 220, 860
2 | 22, 86
11, 43

GCF = 20

GCF

6. Determine the greatest common factor of each set of numbers

a) 150, 275, 420

5 | 150, 275, 420
30, 55, 84

GCF = 5

b) 120, 960, 1400

10 | 120, 960, 1400
2 | 12, 96, 14
6, 48, 7

GCF = 20

c) 126, 210, 546, 714

6 | 126, 210, 546, 714
7 | 21, 35, 91, 119
3, 5, 13, 17

GCF = 42

d) 220, 308, 484, 988

4 | 220, 308, 484, 988
55, 77, 121, 247

GCF = 4

7. Determine the least common multiple of each pair of numbers.

a) 12, 14

2 | 12, 14
6, 7

LCM = 84

b) 21, 45

3 | 21, 45
7, 15

LCM = 315

c) 45, 60

5 | 45, 60
3 | 9, 12
3, 4

LCM = 180

d) 38, 42

2 | 38, 42
19, 21

LCM = 798

e) 32, 45

32, 45

LCM = 1440

f) 28, 52

4 | 28, 52
7, 13

LCM = 364

8. Explain the difference between determining the greatest common factor and the least common multiple of 12 and 14.

GCF = 2,

2 is the greatest divisor that is used to divide both 12 and 14.

$2 \mid 12, 14$
$6, 7$

LCM = 2·6·7 = 84

84 is the smallest number (dividend) that could be divisible by both 12 and 14.

9. Two marching bands are to be arranged in rectangular arrays with the same number of columns. One band has 42 members, the other has 36 members. What is the greatest number of columns in the array?

GCF

$6 \mid 42, 36$
$7, 6$

Ans: The greatest number of columns in the array is "6".

10. How could you use the least common multiple to add, subtract, or divide fractions? Use this strategy to evaluate these fractions.

LCM = common denominator

a) $\frac{9}{14} + \frac{11}{16} = \frac{72+77}{112} = \frac{149}{112} = 1\frac{37}{112}$

$2 \mid 14, 16$
$7, 8$

b) $\frac{8}{15} + \frac{11}{20} = \frac{32+33}{60} = \frac{65}{60} = 1\frac{5}{60} = 1\frac{1}{12}$

$5 \mid 15, 20$
$3, 4$

c) $\frac{5}{24} - \frac{1}{22} = \frac{55-12}{264} = \frac{43}{264}$

$2 \mid 24, 22$
$12, 11$

d) $\frac{9}{10} + \frac{5}{14} + \frac{4}{21} = \frac{189+75+40}{210} = \frac{304}{210} = 1\frac{94}{210} = 1\frac{47}{105}$

$7 \mid 10, 14, 21$
$2 \mid 10, 2, 3$
$5, 1, 3$

5 | 25, 15, 8
5, 3, 8

3 | 5, 18, 3
5, 6, 1

e) $\frac{9}{25}+\frac{7}{15}-\frac{5}{8}$

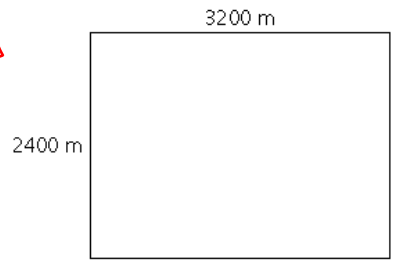
$= \frac{216+280-375}{600}$

$= \boxed{\frac{121}{600}}$

f) $\frac{3}{5}-\frac{5}{18}+\frac{7}{3} = \frac{54-25+210}{90}$

$= \frac{239}{90} = \boxed{2\frac{59}{90}}$

11. A developer wants to subdivide this rectangular plot of land into congruent square pieces. What is the side length of the largest possible square?



GCF = 800

100 | 2400, 3200
4 | 24, 32
2 | 6, 8
3, 4,

Ans: The largest possible square with the side length of 800 m.