Math 10

Lesson 1–2 Answers

**Lesson Questions**

**Question 1**

72

36

18

9

**3**

**2**

**2**

**2**

**3**

**72 = 2 · 2 · 2 · 3 · 3**

 **= 23 · 32**

**Question 2**

5040

315

63

9

**3**

16

**24**

**5**

**7**

**5040 = 24 · 32 · 5 · 7**

**3**

**Question 3**

 152 ÷ 2 = 76 190 ÷ 2 = 95

 76 ÷ 19 = 4 95 ÷ 19 = 5

 2 · 19 = 38

 38 is the greatest common factor of 152 and 190

**Question 4**

Find the least common multiple of 15, 32 and 44. (Two ways?)

**Strategy 1** is to list the multiples of each number to find the first common multiple:

multiples of 15: 15, 30, 45, 60, 75, 90, 105, 120, 135, 150, 165, 180, 195, 210, 225, 240, 255, 270, 285, 300, 315, 330, 345, 360, **give up**

multiples of 32: 32, 64, 96, 128, 160, 192, 224, 256, 288, 320, 352, **give up**

This strategy will only work for these numbers if you are willing to keep writing lots and lots of multiples.

**Strategy 2** is to find the prime factroization for each number and then keep the greatest power of each prime factor:

15 = 3 · 5

32 = 25

44 = 22 · 11

3 · 5 · 25 · 11 = 5280

The least common multiple of 15, 32 and 44 is 5280.

**Question 5**

At Fitz Flooring the Opalescent Arabesque style of tiles measure 20 cm by 36 cm. Assuming the rectangles cannot be cut:

(a) The side length will be the least common multiple of 20 and 36. The prime factors of these numbers are:

 20 = 22 · 5

 36 = 22 · 9

22 · 5 · 9 = 180 is the side length of the smallest square that could be tiled

(b)

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(c) Interior designers who are failed artists. ☺

**Question 6**



**Question 7**

 or

**Nasty question**

(a) Each edge of the cube will be multiple of 56, 28 and 14. Note that 14 is a factor of 28 and 28 is a factor of 56. Therefore the edge length of the cube will be 56.

(b) 56 ÷ 56 = 1

56 ÷ 28 = 2

56 ÷ 14 = 4

Number of bars in the cube = 1 x 2 x 4 = 8

(c) 29 is a prime number and 14 is a factor of 56. Therefore the least common multiple of 56, 14, and 29 is 56 x 29 = 1624 which would be the edge length of the cube.

 1624 ÷ 56 = 29

1624 ÷ 29 = 56

1624 ÷ 14 = 116

Number of bars in the cube = 56 x 29 x 116 = 188 384

**Assignment**

1. a) 6, 12, 18, 24, 30, 36

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

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

2. a) 2, 5

 c) 3, 5

 e) 2, 5, 7

3. a) 3 · 3 · 5, or 32 · 5

 c) 2 · 2 · 2 · 2 · 2 · 3, or 25 · 3

 e) 2 · 2 · 2 · 2 · 2 · 5, or 25 · 5

4. a) 23 · 3 · 52

 b) 2 · 52 · 23

 c) 2 · 7 · 73

5. 0 and 1 are not prime numbers

180 = 2 · 2 · 3 · 3 · 5

224 = 2 · 2 · 2 · 2 · 2 · 7

the GCF is 2 · 2 = 4

46 = 2 · 23

84 = 2 · 2 · 3 · 7

the GCF is 2

6. a) d)

7. a) c)

126 = 2 · 3 · 3 · 7

210 = 2 · 3 · 5 · 7

546 = 2 · 3 · 7 · 13

714 = 2 · 3 · 7 · 17

the GCF is 2 · 3 · 7, or 42

150 = 2 · 3 · **5** · 5

275 = **5** · 5 · 11

224 = 2 · 2 · 3 · **5** · 7

the GCF is 5

32 = 25

45 = 32 · 5

the LCM 25 · 32 · 5 = 1440

45 = 32 · 5

60 = 22 · 3 · 5

the LCM is 22 · 32 · 5 = 180

12 = 22 · 3

14 = 2 · 7

the LCM is 22 · 3 · 7 = 84

8. a) c) e)

9. a) c)

12 = 22 · 3

18 = 2 · 32

25 = 52

30 = 2 · 3 · 5

the LCM is 22 · 32 · 52 = 900

20 = 22 · 5

36 = 22 · 32

38 = 2 · 19

the LCM is 22 · 32 · 5 · 19 = 3420

10.

The greatest common factor is found by looking for the prime factors that are common to the two numbers. In this case 2 is the only common number.

12 = 22 · 3

14 = 2 · 7

The least common multiple is found by multiplying the greatest power of each prime factor in the list. In this case we have 22 · 3 · 7 = 84.

11. The greatest number of columns will be the GCF of 36 and 42

36 = 22 · 32

42 = 2 · 3 · 7

the GCF is 2 · 3 = 6

12. The only number this works for is 1.

13. a)  c) 

 e) 

14. a) c)

22 = 2 · 11

24 = 23 · 3

LCM = 23 · 3 · 11 = 264

∴common denominator is 264

16 = 24

14 = 2 · 7

LCM = 24 · 7 = 112

∴common denominator is 112

 e) g)

25 = 52

15 = 3 · 5

8 = 23

LCM = 23 · 3 · 52 = 600

∴common denominator is 600

15. The largest square will have a side length which is the GCF of 2400 and 3200

 2400 = 100 · 23 · 3

 3200 = 100 · 25

 The GCF is 100 · 23 = 800 m

16. a) The largest square will be the lowest common multiple of 18 and 24

 18, 36, 54, **72**, 90

 24, 48, **72**, 96

the largest square that can be tiled is 72 cm by 72 cm

b) If 648 cm and 1512 are multiples of 18 and 24 respectively, then the tiles would cover such an area



Yes, the 18 x 24 tiles could be used

17. a) If 5280 is a multiple of 66 and 660 then the acre would fit



Yes, acres fit into sections exactly

b) 5280 ÷ 2 = 2640



Yes, acres fit into quarter-sections exactly

c) 660 feet

18. Find the LCM for 10, 6 and 3

 10, 20, **30**, 40

 6, 12, 18, 24, **30**, 36

 3, 6, 9, 12, 15, 18, 21, 24, 27, **30**, 33

 The edge length of the smallest cube is 30 cm.