Grade 7/8 Math Circles
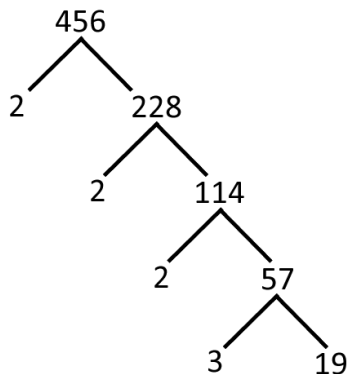## Fall 2012
Factors and Primes

Solutions

1. (a) 1, 2, 7, 14, 49, 98

   (b) 1, 2, 2713, 5426
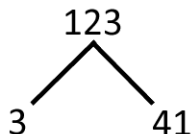
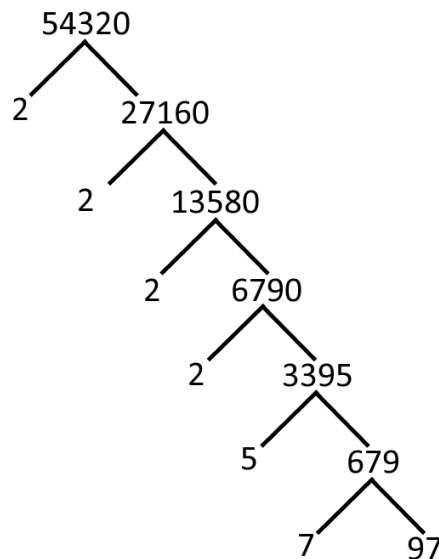   (c) 1, 97

   (d) 1, 13, 169

2. (a) 2459

   2459

   (b) $456 = 2 \times 2 \times 2 \times 3 \times 19 = 2^3 \times 3 \times 19$

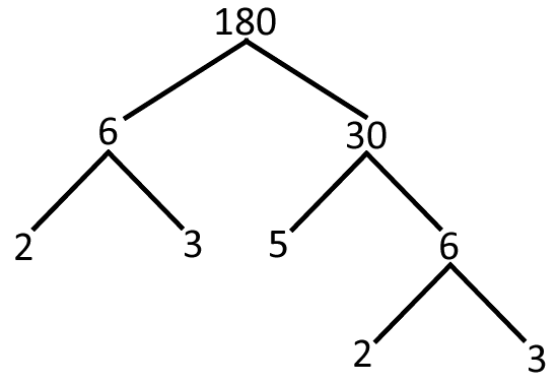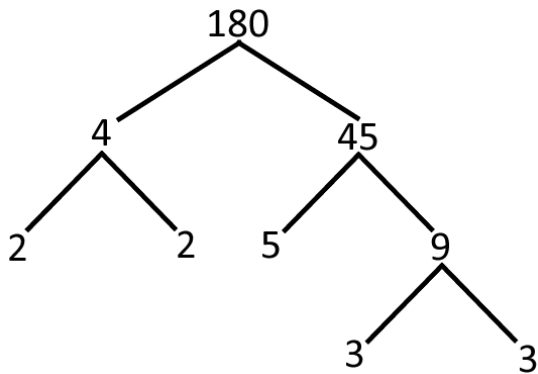   (c) $123 = 3 \times 41$

   (d) $54320 = 2 \times 2 \times 2 \times 2 \times 5 \times 7 \times 97$
   $$= 2^4 \times 5 \times 7 \times 97$$

3. The possibilities are: 1 group of 36 students, 2 groups of 18 students, 3 groups of 12 students, 4 groups of 9 students, 6 groups of 6 students, 9 groups of 4 students, 12 groups of 3 students, 18 groups of 2 students and 36 groups of 1 student.

4. There are multiple solutions for this question, this is only one of the possibilities.

5. (a) 2

   (b) 28

   (c) 41

   (d) 40

6. The different possible dimensions are:

   $1cm \times 1cm \times 1925cm$ $5cm \times 7cm \times 55cm$

   $1cm \times 35cm \times 55cm$ $1cm \times 11cm \times 175cm$

   $1cm \times 5cm \times 385cm$ $5cm \times 11cm \times 35cm$

   $5cm \times 5cm \times 55cm$ $1cm \times 25cm \times 77cm$

   $1cm \times 7cm \times 275cm$ $7cm \times 11cm \times 25cm$

7. 12 (each with 6 basketballs, 7 baseballs and 48 golfballs)

8. (a) 2

   (b) 2, 4, 5, 10

   (c) 2, 3, 4, 6, 8, 9

   (d) 2, 3, 4, 6, 7, 8, 9, 11

   (e) 2, 4, 8

   (f) 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

9. 15

10. 9

11. 211

12. 20 or 80

13. 75 (72, 2, 1)

14. 30

15. 1700, 2550

16. 5 times

17. 2 (burgers) and 3 (buns)

18.   (a) 7, 11, 17, 19, 23, 29, 31, 37, 41, 43, 47, 49

       (b) 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47

       (c) 2, 4, 7, 8, 14, 16, 17, 19, 23, 29, 31, 32, 34, 37, 38, 41, 43, 47, 49