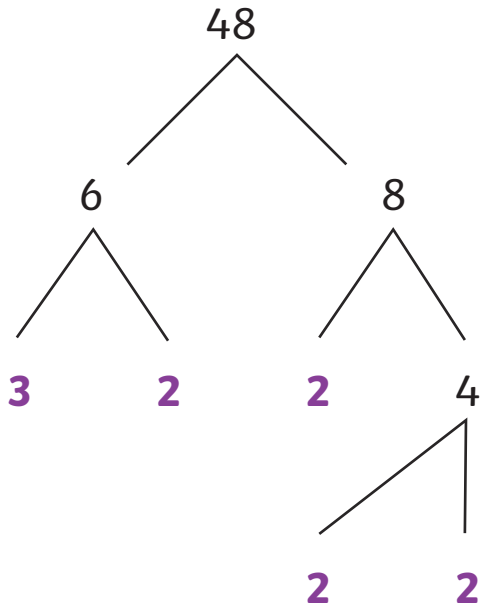
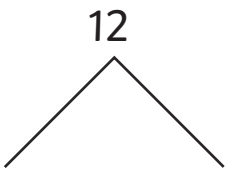
Prime Factors

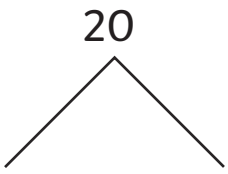
Freddie the Factor Fox is investigating prime factors. Prime factors are prime numbers which, when multiplied together, give you the original number. One way to calculate the prime factors of a number is to use a 'factor tree'. For example, if you wanted to calculate the prime factors of 48, follow these simple steps:

1. Write 48 at the top of the factor tree. Calculate two factors of 48 (6 × 8) and write these on the branches.
2. Now, continue and factor 6 into 3 × 2, adding more branches to the factor tree.
3. Next, factor 8 into 4 × 2.
4. We can factor 4 into 2 × 2 next.
5. When you can't factor any more, you have reached the prime factors. So the prime factors of 48 = 3 × 2 × 2 × 2 × 2 (all the numbers at the bottom of the branches).



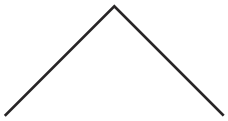
Now help Freddie Fox by using the 'factor tree' method above to calculate the prime factors for each number below. Once completed, write the prime factors on the line provided.





Prime factors of 12 =_____ Prime factors of 20 =_____

18



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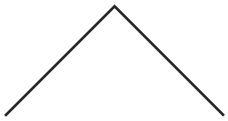
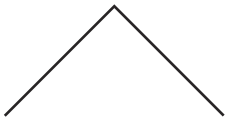


Prime factors of 18 =_____

Prime factors of 30 =_____

15



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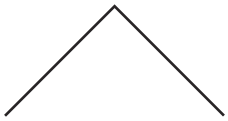
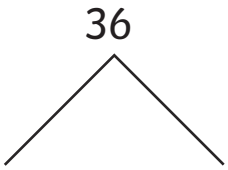
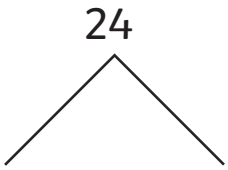


Prime factors of 15 =_____

Prime factors of of 50 =_____





Prime factors of 36 =_____ Prime factors of 24 =_____

Challenge! Is there more than one possible set of prime factors for each number? How do you know?

Prime Factors - **Answers**

Prime factors of 12 = **3 × 2 × 2**

Prime factors of 20 = **2 × 2 × 5**

Prime factors of 18 = **2 × 3 × 3**

Prime factors of 30 = **5 × 2 × 3**

Prime factors of 15 = **3 × 5**

Prime factors of 50 = **2 × 5 × 5**

Prime factors of 36 = **2 × 2 × 3 × 3**

Prime factors of 24 = **2 × 2 × 2 × 3**

Challenge!

There is only one possible set of prime factors for each composite (non-prime) number. This is part of the fundamental theorem of arithmetic.

Prime factor of 12 =_____

Prime factor of 20 =_____