

- Use unit squares to form rectangles. Record the number of different rectangles that you can make.

	Number of unit squares	Number of rectangles		Number of unit squares	Number of rectangles
a.	2	1	g.	8	
b.	3	1	h.	9	
c.	4	2	i.	10	
d.	5		j.	11	
e.	6		k.	12	
f.	7		l.	13	

- Which numbers in Step 1 form exactly 1 rectangle? These numbers are called **prime numbers**. List the prime numbers less than 30.
- The numbers in the list that are not prime are called composite numbers. List the composite numbers less than 30.
- The number 1 is not considered to be prime or composite. Why do you think this is so?
- Give a definition of a prime number that includes the word *factor*.

When two numbers are multiplied, they form a product. Each number is called a factor of that product. Thus, 3 and 8 are factors of 24 because $3 \cdot 8 = 24$, and one way to express 24 in factored form is $3 \cdot 8$. Sometimes individual factors can be factored further. The process ends when all of the factors are prime. Name the prime factors of 24.

When you are asked to factor $3x^2 + 12x$, the first step is to examine the terms for a common monomial factor. Since $3x$ is common to both term, write

$$3x^2 + 12x = 3x(x + 4).$$

Common monomial factor

The polynomial $3x^2 + 12x$ has been factored over the integers because each term in $3x(x + 4)$ has an integer coefficient. When a polynomial has no polynomial factors with integral coefficient except itself and 1, it is a prime polynomial with respect to the integers. In this text, to factor means to factor over integers.

Answer Key

1. d.1

e.2

f.1

g.2

h.2

i.2

j.j

k.3

l.1

2. 2, 3, 5, 7, 11, 13; 2, 3, 5, 7, 11, 13, 17, 19, 23, 29

3. 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28

4. Vary

5. $24 = 2 \cdot 2 \cdot 2 \cdot 3 = 2^3 \cdot 3$