**Prime Numbers:**

A prime number is a number that is only divisible by 1 and itself. This is a list of all prime numbers from 0-100.

**2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97**

You will see a variety of questions about prime numbers. It is best to memorize these numbers in order to answer questions quickly.

**Try these:**

How many prime numbers are between 10 and 30?

Which of these is not a prime number, 9 or 19?

Is 69 a prime number?

Evan used a pattern to count numbers. He counted 4, 8, 12… all the way to 24. How many prime numbers did he count?

How many prime numbers are between 50 and 70?

Sara counted odd numbers from 0 to 40. How many prime numbers did she count?

Jill counted 73 balloons at a party. Is the number she counted a prime number?

How many prime numbers are between 15 and 96?

**Least Common Multiple (LCM):**

The Least Common Multiple is the smallest number that both numbers can divide into.

EX. Find the LCM of 8 and 20.

Strategy:

1. Think about multiples of the smaller number first. Multiples of 8 are 8, 16, 24, 32, 40, 48, 56…
2. Then, think about the multiples of the second number. Multiples of 20 are 20, 40, 60…
3. The LCM of 8 and 20 is 40.

**Greatest Common Denominator (GCD):**

The Greatest common denominator is the highest number that divides evenly into both numbers.

EX. Find the GCD or 12 and 24.

Strategy:

1. Think about numbers that will divide both choices equally. The largest number is the answer.
2. The GCD of 12 and 24 is 6.
	1. Notice that these numbers are also divisible by 3 and 4, but these are not the largest choice!

Try these:

What is the LCM of 5 and 12?

What is the LCM of 8 and 40?

What is the LCM of 3 and 7?

What is the GCD of 25 and 40?

What is the GCD of 14 and 32?

What is the GCD of 6 and 36?

What is the GCD of 12 and 34?

What is the LCM of 14 and 6?

What is the LCM of 4 and 7?

What is the GCD of 21 and 14?

**Adding and Subtracting Fractions:**

EXAMPLE: 2/3 +1/4 = \_\_\_\_\_(fraction)

Strategy:

1. Fractions have to have a common denominator before you can add them. Since 3 and 4 are not the same, each fraction needs to be changed to their least common multiple (LCM).
2. 2/3 = 8/12 and 1/4 = 3/12.
3. **8/12 + 3/12 = 11/12**
4. Another way to find a common denominator is to cross multiply.
	1. A + C = AD + BC

B D BD

**Remember:**

**Before you cross multiply, always look for a LCM.**

**Always reduce or simplify answers!**

**Sometimes you can leave fractions as improper terms. Pay attention to the question to make sure you answer it correctly.**

Try these:

1/8 +3/4 = \_\_\_\_\_\_\_\_\_\_

12/30 + 6/10 = \_\_\_\_\_\_\_\_\_\_

5/6 + 2/4 = \_\_\_\_\_\_\_\_\_\_ (improper fraction)

3/8 + 1/2 = \_\_\_\_\_\_\_\_\_\_

11/12 + 4/3 = \_\_\_\_\_\_\_\_\_\_

1/8 + 2/3 = \_\_\_\_\_\_\_\_\_\_

16/20 + 7/8 = \_\_\_\_\_\_\_\_\_\_ (improper fraction)

5/6 + 7/10 = \_\_\_\_\_\_\_\_\_\_

13/15 + 7/45 = \_\_\_\_\_\_\_\_\_\_

**Comparing Fractions:**

Example: Which is greater 2/5 or 7/10?

Strategy:

1. Fractions are easier to compare when you have a common denominator. You can use the LCM or cross multiplication to change your fractions so that they are comparable.

LCM method: 2/5 = 4/10

Cross Multiplication method: (2x10=20) and (7 x5=35)

1. 7/10 is greater than 2/5

**Sometimes, instead of giving two fractions, you will have one fraction and a decimal to compare!**

Strategy:

1. Change the decimal into a fraction.
2. Then compare them using the same methods described above.

Try these:

Which is greater: 5/6 or 7/9?

Which is greater: 2/3 or 1/5?

Which is less: 3/15 or 4/12?

Which is less: 4/7 or 2/3?

Which is bigger: 0.52 or 4/9?

Which is smaller: 0.61 or 7/12?

Which is greater: 0.3 or 2/3?

Which is bigger: 7/10 or 8/9?

Which is smaller: 3/5 or 3/7?

Which is less: 23/100 or 0.35?

Which is greater: 14/15 or 0.9?

Which is greater: 1/9 or 0.2?

**Fractions to Decimals:**

EXAMPLE: 9/20 = \_\_\_\_(decimal)

Strategy:

1. Divide the numerator by the denominator until you reach a remainder of zero.
2. 9 divided by 20 = 0.45

**Decimals to Fractions:**

EXAMPLE: 0.15 = \_\_\_\_(fraction)

Strategy:

1. First, think of this problem as all the numbers after the decimal on top of the value of the last place.
	1. 0.15 = 15 /100
2. You always have to reduce or simply your fraction to the smallest terms.
	1. 15 / 100 simplifies to 3 / 20

Try these:

5/10 =\_\_\_\_\_\_\_\_\_\_ (decimal)

2/5 = \_\_\_\_\_\_\_\_\_\_ (decimal)

2/3 = \_\_\_\_\_\_\_\_\_\_ (decimal)

2/8 = \_\_\_\_\_\_\_\_\_\_ (decimal)

0.7 = \_\_\_\_\_\_\_\_\_\_ (fraction)

0.52 = \_\_\_\_\_\_\_\_\_\_ (fraction)

0.25 = \_\_\_\_\_\_\_\_\_\_ (fraction)

0.6 = \_\_\_\_\_\_\_\_\_\_ (fraction)

**Decimals to Percents:**

EXAMPLE: 0.82333… = \_\_\_\_(%)

Strategy:

1. First, look at the numbers in the tenths and hundredths place in the decimals. 0.**82**
2. These numbers change to a percent. 0.**82** = **82**%
3. Next, look at any numbers after those two places. These numbers are usually a fraction.
	1. **333** is the same as 1/3.
	2. 666 is the same as 2/3
	3. 111 is the same as 1/9
	4. 222 is the same as 2/9 (cont.)
	5. .09 is the same as 1/11
	6. .18 is the same as 2/11 (cont.)
4. For this problem, **0.82333 = 82 1/3 %**

Try these: (all in %)

0.63 =

0.31 =

0.4 =

0.8 =

0.12333… =

0.87222… =

0.603636… =

0.66666… =

**Fractions to Percents:**

EXAMPLE: 2/5 = \_\_\_\_(%)

Strategy:

1. First, divide 100 by the denominator. 100 / 5 = 20
2. Then, multiply your answer by the numerator. 20 x 2 = 40.
3. Remember, certain fractions will have a repeating percent, such as
	1. **333** is the same as 1/3.
	2. 666 is the same as 2/3
	3. 111 is the same as 1/9
	4. 222 is the same as 2/9 (cont.)
	5. .09 is the same as 1/11
	6. .18 is the same as 2/11 (cont.)

For this problem, **2/5 = 40%**

Try these: (all in %)

1/2 =

1/4 =

4/5 =

6/10 =

1/3 =

3/11 =

7/9 =

4/8 =

**Squares:**

EXAMPLE: 182

Strategy:

1. The exponent 2 tells you to multiply the number two times. This means you are solving the problem 18 x 18.
2. For the number sense test, it is helpful to memorize squared numbers from 1 to 20.

|  |  |  |  |
| --- | --- | --- | --- |
| 12 | 1 | 112 | 121 |
| 22 | 4 | 122 | 144 |
| 32 | 9 | 132 | 169 |
| 42 | 16 | 142 | 196 |
| 52 | 25 | 152 | 225 |
| 62 | 36 | 162 | 256 |
| 72 | 49 | 172 | 289 |
| 82 | 64 | 182 | 324 |
| 92 | 81 | 192 | 361 |
| 102 | 100 | 202 | 400 |

1. From the table, we can see that 182  (18x18) = 324

Try these:

52 =

122 =

102 =

82 =

152 =

192 =

172 =

222 =

**Ratios:**

EXAMPLE: 5 is to 8 as 10 is to what?

Strategy:

1. To solve a ratio problem, think of the terms as fractions. In this example, you are trying to figure out 5 = 10

 8 ?

1. First, cross multiply. (10x8=80) and (5x? = 5?) This means that you have 80/5.
2. Divide to find the answer. 80 divided by 5 = 16.
3. The answer is 16.

EXAMPLE: 3 is to 4 as what is to 12?

Strategy:

1. In this example, you are trying to figure out

 3 = ?

 4 12

1. First, cross multiply. (3 x 12 = 36)) and (4 x ? = 4?) This means that you have 4/36.
2. Divide to find the answer. 4 divided by 36 = 9
3. The answer is 9.

Try these:

1 is to 2 as 6 is to what?

3 is to 8 as 6 is to what?

6 is to 14 as 3 is to what?

5 is to 8 as 7 is to what?

2 is to 10 as what is to 15?

5 is to 7 as what is to 28?

3 is to 9 as what is to 3?

4 is to 7 as what is to 12?