

This is a collection of some of the more difficult concepts a student would have encountered before grade 6. Do your best to answer each question. You can use additional sheets of paper. If you don't know how to solve a problem then now is a great time to learn.

Is my child ready for Grade 6 Math?

Correct Answers	Ready?
13–15	Oh yeah. They're ready.
10–12	Yes. There might be a few ideas to review.
7-9	Probably. Go over the solutions together. Is your child familiar with the ideas and techniques?
4-6	There appear to be some gaps that should be filled. Are you willing to put in the necessary time before class starts to fill those gaps?
0-3	Unlikely. That's ok. These were not easy questions. Use this as an opportunity to identify things that you can work on to get ready.

1. How many  $3 \times 3$  squares can fit inside a rectangle with a height of 24 and width of 18?

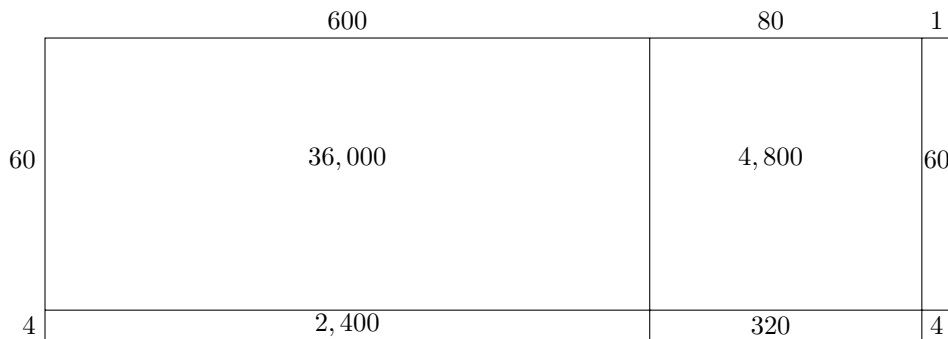
**Solution:** Divide the height and width each by 3 to see that the squares will form a rectangle consisting of 8 squares by 6 squares for a total of  $8 \times 6 = 48$  squares.

2. Write the prime factorization of 200. (I.e. write 200 as a product of prime numbers.)

**Solution:**  $200 = 2 \times 2 \times 2 \times 5 \times 5 = 2^3 \times 5^2$ .

3. What is the value of  $64 \times 681$ ?

**Solution:** There are lots of ways to get the answer. Here is a solution that uses an area model.



$$36,000 + 2,400 + 4,800 + 320 + 60 + 4 = 43,584$$

4. If today is Tuesday, what day of the week will it be 100 days from now?

**Solution:** Every 7 days, the day of the week repeats. It will be a Tuesday on days 0, 7, 14, 21, . . . , 91, 98. Since day 98 will be a Tuesday, day 100 will be a Thursday.

(Notice that all we are doing here is finding the remainder after dividing by 7. We could find the day of the week for day 1000 by noting that the remainder when dividing 1000 by 7 is 6, so day 1000 would be a Monday.)

5. Which is bigger:  $3\frac{5}{7} + 5\frac{3}{7}$  or  $2\frac{4}{7} \times 3$ ?

**Solution:** When adding mixed numbers, you can add the fractional parts and the whole number parts separately.  $3\frac{5}{7} + 5\frac{3}{7} = 8 + \frac{8}{7} = 8 + 1 + \frac{1}{7} = 9\frac{1}{7}$ .

To multiply a mixed number by a whole number we could write everything as a fraction and then multiply:  $2\frac{4}{7} \times 3 = \frac{18}{7} \times \frac{3}{1} = \frac{54}{7} = 7\frac{5}{7}$ .

In the end, we see that  $3\frac{5}{7} + 5\frac{3}{7} > 2\frac{4}{7} \times 3$

6. A store has marked the price of each DVD at \$16.99 each. However, a sale sign indicates that the price of each DVD is reduced by \$5. Write an expression (number sentence) that will give the price of 6 DVDs in dollars. Then find the price for 6 DVDs.

**Solution:** The new price of each DVD is  $\$(16.99 - 5)$ , so the total price is  $6 \times (16.99 - 5)$  dollars. This expression simplifies to be  $6 \times (16.99 - 5) = 6 \times (11.99) = 71.94$  dollars.

7. Write the number 22 million, 14 thousand, 733.

**Solution:** 22,014,733

8. What does the digit 4 mean in the number 652,488,608?

**Solution:** The 4 is in the hundred-thousands place, so it means 400,000.

9. It costs \$6 to ride a roller coaster. How many roller coaster rides can a person have for \$728?

**Solution:** Carry out the long division to see that  $6 \times 121 = 726$ , so the person can have 121 rides and be left with \$2.

10. A 12 ft long board is cut into pieces that are  $\frac{3}{4}$  of a foot in length. How many total pieces are obtained?

**Solution:** We're dividing a 12 ft board, so we carry out the calculation  $\frac{12}{\frac{3}{4}} = \frac{12}{\frac{3}{4}} = \frac{12}{1} \times \frac{4}{3} = \frac{48}{3} = 16$ . There will be 16 total pieces.

11. Place the following six values in order from least to greatest?  $1^6, 2^5, 3^4, 4^3, 5^2, 6^1$

**Solution:** This question is testing whether you understand exponents.

$$1^6 = 1 \times 1 \times 1 \times 1 \times 1 \times 1 = 1.$$

$$2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32.$$

$$3^4 = 3 \times 3 \times 3 \times 3 = 81.$$

$$4^3 = 4 \times 4 \times 4 = 64.$$

$$5^2 = 5 \times 5 = 25.$$

$$6^1 = 6.$$

Thus  $1^6 < 6^1 < 5^2 < 2^5 < 4^3 < 3^4$ .

12. John claims that when you divide 10 by a number the result will be less than 10. Give an example of a number you could use to show that John is incorrect.

**Solution:** Any value between 0 and 1 will work. For example,  $\frac{10}{1/2} = 20$ .

13. A rectangular prism has a volume of  $84 \text{ cm}^3$ . Its height is 3 cm, and its width is 4 cm. What is its length?

**Solution:** Volume is length times width times height, so  $84 = 4 \times \text{length} \times 3$ . Divide both sides of the equation by 12 to get  $7 = \text{length}$ . The length is 7 cm.

14. Place the following values in order from least to greatest.

$$5.6, \quad \frac{23}{4}, \quad 5.19, \quad 5\frac{1}{2}, \quad 6\frac{1}{20}$$

**Solution:** It might be easiest to convert each number to a decimal.

$$\frac{23}{4} = 5\frac{3}{4} = 5.75.$$

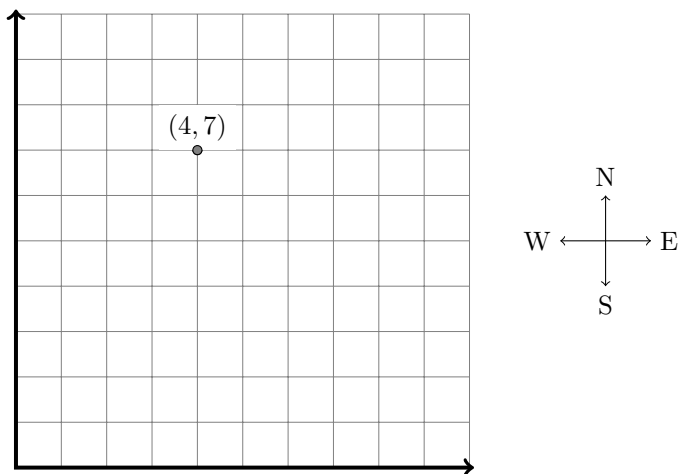
$$5\frac{1}{2} = 5.5.$$

$$6\frac{1}{20} = 6.05.$$

Thus

$$5.19 < 5.5 < 5.6 < 5.75 < 6.05 \quad \text{so} \quad 5.19 < 5\frac{1}{2} < 5.6 < \frac{23}{4} < 6\frac{1}{20}.$$

15. An ant starts at the point with coordinates (4, 7). It crawls 3 units East, 5 units South, and then 6 units West. What are the coordinates of the point where the ant is now?



**Solution:**

