Oral Exam Study Guide

Using the Study Guide

Most Difficult Multiplication Facts

- Although I may ask you any of the facts from the multiplication facts table, focus especially on the highlighted most difficult ones.
- Recall that you only need to know *half* of the multiplication facts table since $2 \times 3 = 3 \times 2$, according to the commutative property of multiplication.
- You may want to learn the facts in this order: 2, 10, 11, 5, 3, 4, 9, 6, 7, 8, 12.
- Be mindful to the patterns of each number to help your recall.
- Secure "beachheads" in each row by memorizing easy products.
    - Then add or subtract multiples of that number to arrive at the answer.

Divisibility Rules

- The divisibility rules for 2, 5, and 10 are fairly easy to remember.
- The numbers 3 and 9 have the *same* divisibility rule.

Prime Numbers 2-47

- Notice that prime numbers are not listed in the multiplication facts table since by definition, a prime number has *two different factors,* itself and 1.
    - For example, 17 is prime because its only factors are 17 and 1.
- A composite number has *more than two* factors.
    - For example, 6 is composite because it has the factors 6, 1, 3, 2.
- The number 1 is neither prime nor composite since the *factors are the same.*
- The number 2 is the only even prime number.
- Besides 2, all prime numbers are odd. However, not all odd numbers are prime.
    - For example, the numbers 9, 15, 21, 35, etc. are odd, but not prime.
- Memorize all the prime numbers up to *47.*

Oral Exam Test Sheet

- See both sides of the Oral Exam test sheet for guidance.

Study Strategy

- You get 60 seconds to answer 10 questions, averaging 6 seconds per question.
- Work on *accuracy first,* and *speed second.*
- Have study sessions in the morning, during the day, and in the evening.
- Study for 15-30 minutes each session, every day, until the Oral Exam.

Most Difficult Multiplication Facts

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

DIVISIBILITY RULES

Divisible By?	Rule for Divisibility	Examples
2	A number is **divisible by 2** if its ones digit is even (0, 2, 4, 6, 8).	10, 86, 102, 384
3	A number is **divisible by 3** if the sum of its digits is divisible by 3.	18, 36, 123, 609
5	A number is **divisible by 5** if its ones digit is 0 or 5.	20, 65, 130, 785
9	A number is **divisible by 9** if the sum of its digits is divisible by 9.	27, 63, 162, 819
10	A number is **divisible by 10** if its ones digit is 0.	30, 90, 170, 540

PRIME NUMBERS FROM 2 TO 97

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

Oral Exam

Last Updated: 7/4/24

Name: _____ **Date:** _____

Attempt: _____ **of 2** **Score:** _____% **Time Expired?** Y ☐

Instructions:

- (1) I ask a question, (2) you say the answer, (3) I write your answer.
- You have 60 seconds to answer 10 questions.
- A minimum 8 out of 10 (80% score) is required to pass.

Key:
C = Correct
I = Incorrect
N = No Answer

Pick ☑	Multiplication Facts	C	I	N
☐	2 × 6 = _____	☐	☐	☐
☐	2 × 7 = _____	☐	☐	☐
☐	2 × 8 = _____	☐	☐	☐
☐	2 × 9 = _____	☐	☐	☐
☐	2 × 12 = _____	☐	☐	☐
☐	3 × 6 = _____	☐	☐	☐
☐	3 × 7 = _____	☐	☐	☐
☐	3 × 8 = _____	☐	☐	☐
☐	3 × 9 = _____	☐	☐	☐
☐	3 × 12 = _____	☐	☐	☐
☐	4 × 6 = _____	☐	☐	☐
☐	4 × 7 = _____	☐	☐	☐
☐	4 × 8 = _____	☐	☐	☐
☐	4 × 9 = _____	☐	☐	☐
☐	4 × 12 = _____	☐	☐	☐
☐	5 × 6 = _____	☐	☐	☐
☐	5 × 7 = _____	☐	☐	☐
☐	5 × 8 = _____	☐	☐	☐
☐	5 × 9 = _____	☐	☐	☐
☐	5 × 12 = _____	☐	☐	☐
☐	6 × 6 = _____	☐	☐	☐
☐	6 × 7 = _____	☐	☐	☐
☐	6 × 8 = _____	☐	☐	☐
☐	6 × 9 = _____	☐	☐	☐
☐	6 × 12 = _____	☐	☐	☐
☐	7 × 7 = _____	☐	☐	☐
☐	7 × 8 = _____	☐	☐	☐
☐	7 × 9 = _____	☐	☐	☐
☐	7 × 12 = _____	☐	☐	☐
☐	8 × 8 = _____	☐	☐	☐
☐	8 × 9 = _____	☐	☐	☐
☐	8 × 12 = _____	☐	☐	☐
☐	9 × 9 = _____	☐	☐	☐
☐	9 × 12 = _____	☐	☐	☐
☐	10 × 11 = _____	☐	☐	☐
☐	10 × 12 = _____	☐	☐	☐
☐	11 × 11 = _____	☐	☐	☐
☐	11 × 12 = _____	☐	☐	☐
☐	12 × 12 = _____	☐	☐	☐

Pick ☑	Divisibility Rules	C	I	N
☐	2: _____	☐	☐	☐
☐	3: _____	☐	☐	☐
☐	5: _____	☐	☐	☐
☐	9: _____	☐	☐	☐
☐	10: _____	☐	☐	☐
☐	46 divisible by _____? Why?	☐	☐	☐
☐	51 divisible by _____? Why?	☐	☐	☐
☐	475 divisible by _____? Why?	☐	☐	☐
☐	___ divisible by _____? Why?	☐	☐	☐

Pick ☑	Prime Numbers	C	I	N
☐	2 prime? Y ☐ N ☐	☐	☐	☐
☐	3 prime? Y ☐ N ☐	☐	☐	☐
☐	5 prime? Y ☐ N ☐	☐	☐	☐
☐	7 prime? Y ☐ N ☐	☐	☐	☐
☐	11 prime? Y ☐ N ☐	☐	☐	☐
☐	13 prime? Y ☐ N ☐	☐	☐	☐
☐	17 prime? Y ☐ N ☐	☐	☐	☐
☐	19 prime? Y ☐ N ☐	☐	☐	☐
☐	23 prime? Y ☐ N ☐	☐	☐	☐
☐	29 prime? Y ☐ N ☐	☐	☐	☐
☐	31 prime? Y ☐ N ☐	☐	☐	☐
☐	37 prime? Y ☐ N ☐	☐	☐	☐
☐	41 prime? Y ☐ N ☐	☐	☐	☐
☐	43 prime? Y ☐ N ☐	☐	☐	☐
☐	47 prime? Y ☐ N ☐	☐	☐	☐
☐	A prime 0-9? _____	☐	☐	☐
☐	A prime 10-19? _____	☐	☐	☐
☐	A prime 20-29? _____	☐	☐	☐
☐	A prime 30-39? _____	☐	☐	☐
☐	A prime 40-49? _____	☐	☐	☐
☐	9 prime? Y ☐ N ☐	☐	☐	☐
☐	15 prime? Y ☐ N ☐	☐	☐	☐
☐	27 prime? Y ☐ N ☐	☐	☐	☐
☐	33 prime? Y ☐ N ☐	☐	☐	☐
☐	49 prime? Y ☐ N ☐	☐	☐	☐
☐	__ prime? Y ☐ N ☐	☐	☐	☐

Details

- The **Oral Exam** exhibits mastery of (1) multiplication facts, (2) divisibility rules, and (3) prime numbers.
- You get *two* attempts to pass the Oral Exam, which is required to pass MAT 025.
- If you get less than an 80% score, only *one* retake of the Oral Exam is permitted, but not on the same day.
- Since you get 60 seconds to answer 10 questions, you have on average 6 seconds to answer each question.
- Before your exam, I will randomly pick 10 questions from the Oral Exam test sheet that involves any combination of (1) multiplication facts, (2) divisibility rules, and (3) prime numbers.
- You may be asked any of the following mix of questions:
    - 10 multiplication facts.
    - 5 multiplication facts and 5 divisibility rules.
    - 5 multiplication facts and 5 prime numbers.
    - 5 divisibility rules and 5 prime numbers.
    - 10 prime numbers.
    - 6 multiplication facts, 2 divisibility rules, and 2 prime numbers.
    - Any other combination of multiplication facts, divisibility rules, and prime numbers.
- Use this test sheet to continually practice with someone until you consistently score 80% or higher.

Preparing for the Oral Exam

- Prepare for any multiplication fact from 2 to 12.
    - **Sample Question 1:** What is the *product* of the two given *factors?*
        - Version A: "*What* is 6 times 9?"
        - Version B: "6 times 9 is *what*?"
        - Version C: "*What* is 9 times 6?" [Order of factors switched]
        - Version D: "9 times 6 is *what*?" [Order of factors switched]
    - **Sample Question 2:** What are two *factors* of the given *product* from the multiplication table?
        - Version A: "54 is *what* number times *what* number?"
        - Version B: "*What* number times *what* number is 54?"
    - **Sample Question 3:** What is the *other factor* when given *one factor* and the *product*?
        - Version A: "*What* times 6 is 42?"
        - Version B: "6 times *what* is 42?" [Order of factors switched]
        - Version C: "42 is 6 times *what*?"
        - Version D: "42 is *what* times 6?" [Order of factors switched]
- Prepare for any divisibility rule from 2, 3, 5, 9, and 10.
    - **Sample Question 1:**
        - Version A: "What is the divisibility rule for the number 9?"
        - Version B: "The number 9 has what divisibility rule?"
    - **Sample Question 2:**
        - Version A: "The number 475 is divisible by what number based on its divisibility rule? What is the rule?"
        - Version B: "What number divides into 475 based on its divisibility rule? What is the rule?"
- Prepare for any of the 15 prime numbers from 2 to 47.
    - **Sample Question 1:** "Is 19 a prime number?"
    - **Sample Question 2:** "Is 27 a prime number?"
    - **Sample Question 3:** "Name a prime number between 40 and 49."