Product Relationship (Greater/Less Than)

A. Fill in the Blanks

1. Multiplying a positive number by a proper fraction (like 1/2 or 3/4) makes the product _____ than the original number.

2. Multiplying a negative number by a value greater than 1 makes the product _____ than the original negative number.

3. For the statement A × B > A to be true, where A is a positive number, B must be _____.

4. The product of any number and -1 is always _____ the product of that same number and 1.

5. Multiplying any negative number by another negative number will always result in a product that is _____ than the original negative number.

B. Match the Following;

Column A (Expression)	Column B (Product Description)
1. 40 × 1.5	A. The product is negative and greater than −20.
2. −20 × 0.5	B. The product is positive and greater than 40.
3. 18 × (−2)	C. The product is positive but less than 18.
4. −8 × (−3)	D. The product is negative and less than 18.
5. 18 × $\frac{1}{2}$	E. The product is positive and greater than −8.

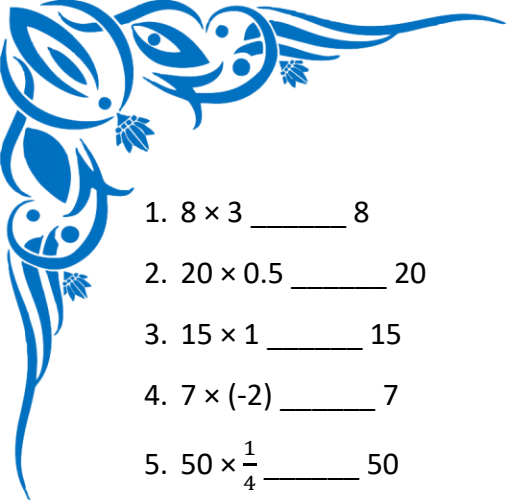## C. Practice Problems

Fill in the blank with the correct symbol: >, <, or =. These problems include positive and negative numbers, fractions, and decimals

1. 12 × (-0.25) _____ 12

2. − 7 × 4 _____ − 7

3. − 10 × 0.5 _____ − 10

4. − 5 × (− 3) _____ − 5

5. $\frac{3}{4}$ × 16 _____ 16

D. Warm-up Questions

Fill in the blank with the correct symbol: >, <, or =. You don't need to calculate the exact answer, just think about the relationship

1. 8 × 3 _____ 8

2. 20 × 0.5 _____ 20

3. 15 × 1 _____ 15

4. 7 × (-2) _____ 7
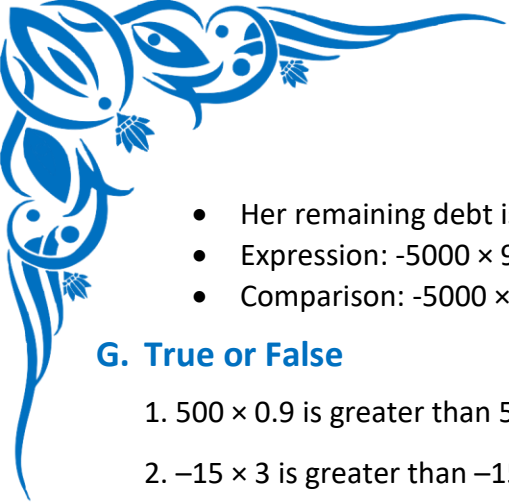
5. $50 \times \frac{1}{4}$ _____ 50

E. Challenge Questions

Analyze the following statements and fill in the blank with >, <, or =. Think abstractly!

1. If x is a positive number, then x × 0.8 _____ x.

2. If y is a negative number, then y × 3 _____ y.

3. If z is a negative number, then z × (− 5) _____ z.

4. If a > 1, then 100 × a _____ 100.

5. If 0 < b < 1, then -50 × b _____ − 50.

F. Word Problems & Application

Read each problem carefully. Write a multiplication expression and then determine the relationship using >, <, or =.

1. A recipe for a cake calls for 2 cups of flour. You want to make a bigger cake, so you decide to use 1.5 times the ingredients. Is the amount of flour you use now greater than or less than 2 cups?

   - Expression: 2 × 1.5
   - Comparison: 2 × 1.5 _____ 2

2. You have a phone plan that gives you 10 GB of data. This month, you only used 3/4 of your data. Is the data you used greater than or less than 10 GB?

   - Expression: 10 × 3/4
   - Comparison: 10 × 3/4 _____ 10

3. David owes the bank 200 (represented as −200). The bank charges a fee that doubles his debt. Is his new debt greater than or less than his original debt of −200?

   - Expression: -200 × 2
   - Comparison: -200 × 2 _____ -200

4. The temperature is -4°C. A cold front moves in, and a meteorologist predicts the temperature will feel 1.5 times colder due to wind chill. Is the wind chill temperature greater than or less than -4°C?

   - Expression: -4 × 1.5
   - Comparison: -4 × 1.5 _____ -4

5. Maria has a student loan of 5,000 (represented as −5000). She pays off 1/10 of the loan. Is her new loan balance greater than or less than the original −5000? (Hint: Paying it off makes the debt smaller, so the number gets closer to 0).

- Her remaining debt is 9/10 of the original.
- Expression: -5000 × 9/10
- Comparison: -5000 × 9/10 _____ -5000

G. True or False

1. 500 × 0.9 is greater than 500.   _____

2. −15 × 3 is greater than −15.   _____

3. Multiplying a number by $\frac{7}{5}$ will result in a smaller number.   _____

4. −10 × (−0.5) is less than −10.   _____

5. The product of a positive number and a negative number is always less than 0.   _____