

2022 MATH 9 PLACEMENT EXAM

1. Open the parentheses and expand the following expressions

$$(a + 3b)^2 =$$

$$(a - b)^3 =$$

2. Solve the inequality

$$x + \frac{1}{x} > 4.25$$

3. Factor the following expressions

$$a^2 - b^2 =$$

$$a^3 - b^3 =$$

$$a^3 + b^3 =$$

$$1 + a + a^2 + a^3 =$$

4. Alice, Bob, Charlie, and Diana are buying ice cream. The store has 15 different flavors of ice cream. How many ways there are for them to choose if each kid chooses one ice cream flavor? How will the answer change if in addition, we require that no two of them choose the same flavor?
5. Find the coefficient of x^5 in the polynomial $(2x - 1)^8$
6. How many divisors does the number 360 have?
7. What is the last digit of 7^{2021} ?
8. Given angle $\angle AOB$, construct the angle bisector using straightedge and compass.
(You can do your construction online here: <https://www.geogebra.org/geometry/nrn7t5nr>)