

MATH 7 HOMEWORK 2 REVIEW 2

September, 27 2026

1. You throw a coin 5 times. What is the probability to get a) TTHTT? b) HHHTT?
2. In how many ways can one arrange 5 books on a shelf?
3. We roll two identical dice. What is the probability of getting 1 and 3?
4. A group of 6 club members always dine at the same round table in the club. There are exactly 6 chairs at the table. They decided that each day, they want to seat in a different order. How many different arrangements are possible? Sitting arrangement is considered different if it can't be reduced to the existing one by rotation.
5. In a computer game, a wizard is more powerful than an orc, so when a wizard fights an orc, he has 60% chance of winning. If a wizard fights one by one a group of 5 orcs, what are the chances that he will defeat them all?
6. For each of the sets below, draw it on the number line and then describe its complement

(a) $[0, 2]$

(b) $(-\infty, 1] \cup [3, \infty)$

(c) $(0, 5) \cup (2, \infty)$

Hint: you should have 6 number lines.

7. Solve the following inequalities, draw solution on the number line

a. $-x < 2$

d. $1 + 5x < 3x$

b. $2 - 3x > 5$

e. $2x - 1 < x - 7$

c. $3x + 1 < 5x + 7$

8. Solve the following inequality: $(x + 1)(x - 2) > 0$

9. Expand the expressions:

a. $2x(a + 2b + 3c)$

d. $(b^2 - 2b + 1)(b - 1)$

b. $-3y(a - ay + by)$

e. $(4x - 7y)(4x + 7y)$

c. $(a^2 + 2a + 1)(a + 1)$

f. $(6x^2 - y)(7x^2 - 2x - 5)$

10. Factor (i.e., write as a product) the following expressions:

a. $ac + ab$

b. $x^2 + 3x^3$

c. $x^2 - 2x - yx + 2y$

d. $4x^2 - 4x + 1$

e. $4x^2 + 16x + 2xy + 8y$

f. $x^2(x + 4) + 5(x + 4)$

g. $100x^8y^2 - 16x^4y^6$

h. $x^2 - 7$ Hint: $7 = (\sqrt{7})^2$

i. $a^4 - b^4$ Hint: $a^4 = (a^2)^2$