

**MATH 8: HANDOUT 0**  
**REVIEW PROBLEMS**

1. Open parentheses and expand the following expressions

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

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

2. Factor the following expressions:

(a)  $a^2 - b^2 =$

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

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

3. Expand as sums of powers of  $x$ :

$$(2x + 1)^2(2 - 3x)$$

4. A group of 19 people want to select a chairperson and two associates. How many ways there are for them to do so?

5. Solve the equation

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

6. Consider the following quadratic equation:

$$x^2 - 5x - 14 = 0$$

(a) What is the discriminant of this equation?

(b) Sketch a graph of this quadratic polynomial

(c) Solve the equation.

7. Let  $x + y = 7$  and  $xy = 8$

(a) Write down the quadratic equation so that  $x$  and  $y$  are its solutions.

(b) Calculate  $x^2 + y^2$ .

8. Write down the following fraction in a form  $a + b\sqrt{5}$ :

$$\frac{9 - 3\sqrt{5}}{\sqrt{5} - 2}$$

9. Solve the following inequality. Write your answer as a set of possible values for  $x$ .

$$\frac{(x + 2)^2(x - 7)}{x + 3} \leq 0$$

10. Which of the following numbers is the largest:  $\sin 30^\circ \times \cos 30^\circ$ ,  $\sin 45^\circ \times \cos 45^\circ$ ,  $\sin 60^\circ \times \cos 60^\circ$ ?