BECA / Dr. Huson / Mathematics
10 June 2019
IB Math SL
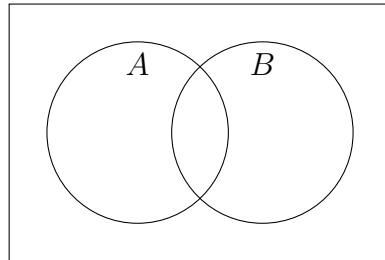
Problem Set: Polynomials & complex numbers

1. Simplify $2i(1 - 2i)$

2. Simplify $(3 + 3i) - (2 - 3i)$

3. Simplify $(3 + i)(4 - 2i)$

4. Shade the region representing $A \cup B$ in the Venn diagram.

5. What is the quotient when $x^2 - 3x - 40$ is divided by $x - 8$?
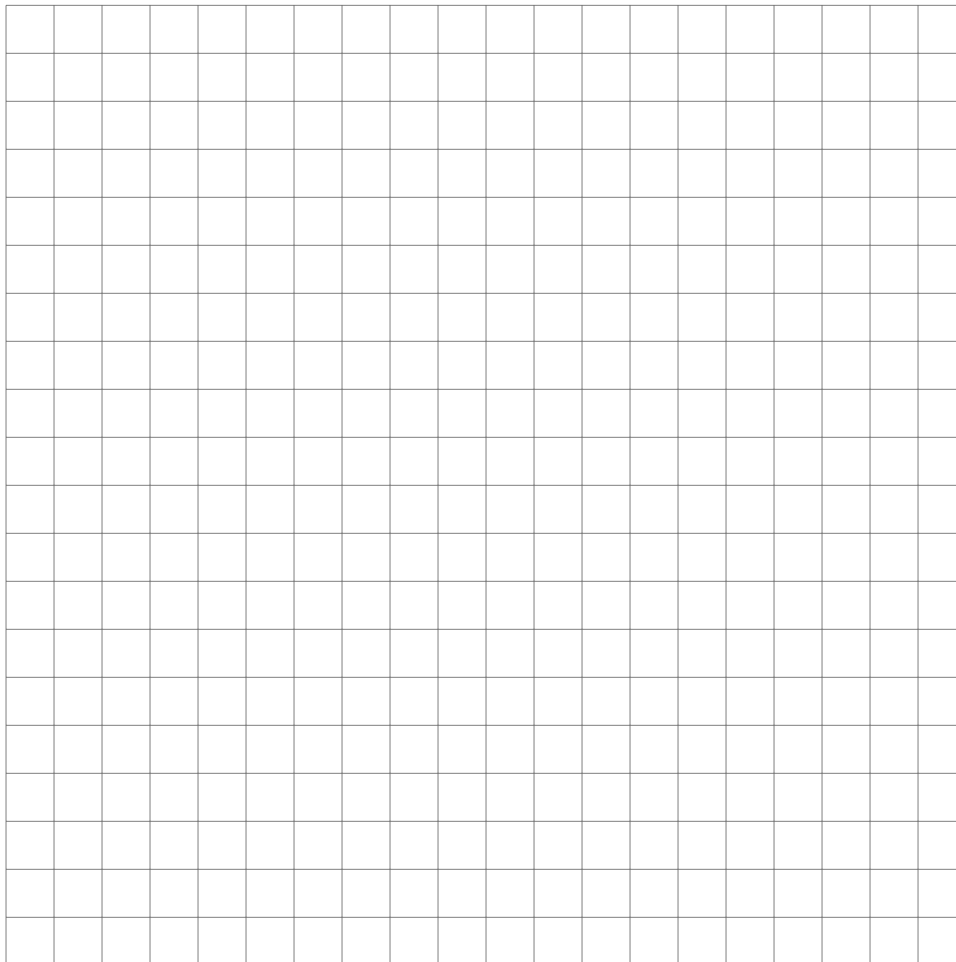
6. Given: $f(x) = 2x^2 - 3$ and $g(x) = x + 1$

   Express $f(x) \bullet g(x) - f(x) + g(x)$ as a polynomial in standard form.

7. If $p(x) = 2x^3 - 3x + 5$, what is the remainder of $p(x) \div (x - 5)$?

8. Use long division to determine the quotient and remainder of $(x^3 + 4x^2 - 8x - 6) \div (x + 2)$.

9. The zeros of a quartic polynomial function h are $-1, \pm 2$, and 3. Sketch a graph of $y = h(x)$ on the grid below.

10. What is the equation of the line with slope -1 passing through the point $(0, 2)$?

11. Given the function $f(x) = (x - 3)(x + 3)$. State the x-intercepts of the graph of f. Find the coordinates of the vertex of the graph of f.

12. Given independent events A and B, with $P(A) = 0.4$ and $P(B) = 0.5$

    (a) Find $P(A \cap B)$

    (b) Find $P(A \cup B)$

13. Solve the following system of equations algebraically for all values of x, y, and z:

$$x + y + z = 1$$
$$2x + 4y + 6z = 2$$
$$-x + 3y - 5z = 11$$