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5 June 2019
11.1 IB Math SL

Classwork: Polynomials & complex numbers

1. What is the quotient when $x^2 - 3x - 40$ is divided by $x + 5$?

2. Given: $f(x) = 2x^2 + x - 3$ and $g(x) = x - 1$
   Express $f(x) \cdot g(x) - [f(x) + g(x)]$ as a polynomial in standard form.

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

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

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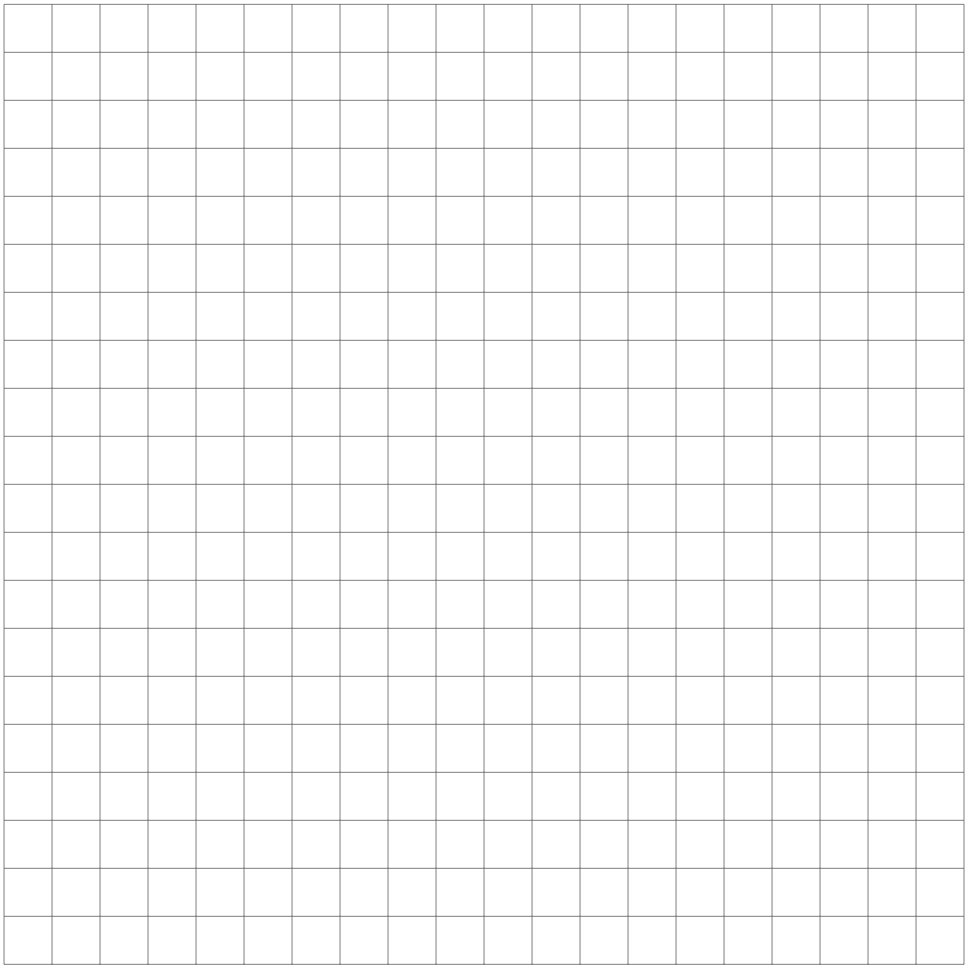
5. The zeros of a quartic polynomial function h are $-1, \pm 2$, and 3. Sketch a graph of $y = h(x)$ on the grid below.



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

7. 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.

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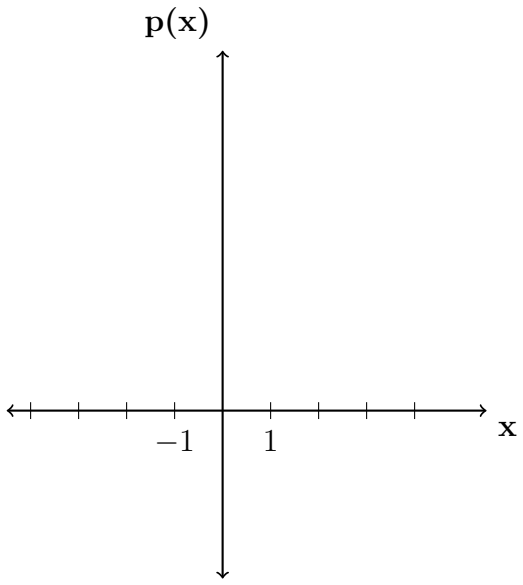
8. The graph of the function $p(x)$ is sketched below.



Which equation could represent $p(x)$?

(a) $p(x) = (x^2 - 9)(x - 2)$
(b) $p(x) = x^3 - 2x^2 + 9x + 18$
(c) $p(x) = (x^2 + 9)(x - 2)$
(d) $p(x) = x^3 + 2x^2 - 9x - 18$

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

10. Simplify $(6 + 2i) - (3 - 2i)$

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

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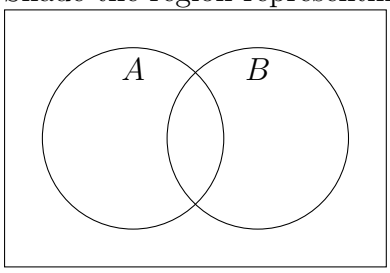
12. Shade the region representing $A \cap B$ in the Venn diagram.



13. Given independent events A and B, with $\mathrm{P}(A) = 0.4$ and $\mathrm{P}(B) = 0.5$

    (a) Find $\mathrm{P}(A \cap B)$

    (b) Find $\mathrm{P}(A \cup B)$

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

$$x + y + z = 1$$

$$2x + 4y + 6z = 2$$

$$-x + 3y - 5z = 11$$