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11 June 2019

Classwork: Polynomial long division

Write your answers in the space provided. Attach your work on a separate sheet of lined paper, clearly labeling the problems.

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

2. What are the quotient and remainder when $x^3 + 3x^2 - x + 2$ is divided by $x - 1$?

3. Given the function $f(x) = (x - 1)(x + 3)$. State the x-intercepts of the graph of f. Find the y-intercept of the graph of f.

4. If $(x - 3)$ is a factor of $f(x) = (x - 3)(ax^2 + bx + c)$, then what is the value of $f(3)$?

5. When $g(x)$ is divided by $x+4$, the remainder is 0. Given $g(x) = x^4+3x^3-6x^2-6x-8$. Write down the value of $g(-4)$.

6. Using the quadratic formula or otherwise, find the solution set for $2x^2 - 3x - 5 = 0$.

7. Simplify the expression $\sqrt{a} \cdot \sqrt{a^5}$

8. Simplify the expression $\left(\frac{x^{-2}}{x^2}\right)^{\frac{1}{2}}$ to one with positive integer exponents and radicals.

9. Simplify the expression $(-3 + 2i)(4 + 3i)$.

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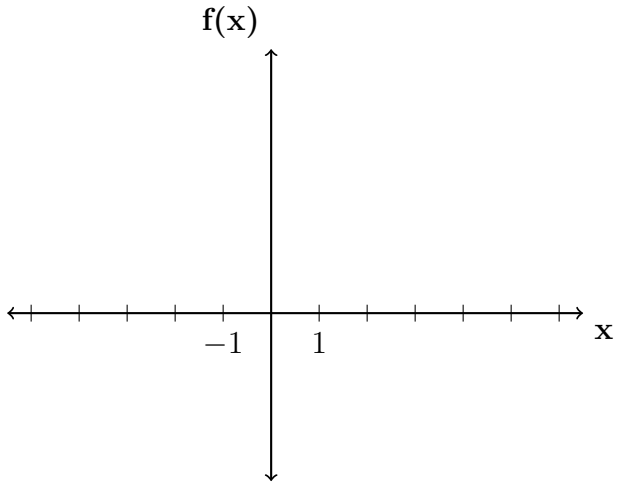
10. Simplify the expression $2xi(4 + 3i)$.

11. The graph of the cubic function $f(x)$ is sketched below. The leading coefficient of f is one.

    (a) What are the roots of $f(x)$?

    (b) Express $f(x)$ as a polynomial in standard form.

    (c) Find the y-intercept of f



12. Explain why the expression $8^{\frac{2}{3}}$ is equivalent 4 according to the rules of fractional exponents.

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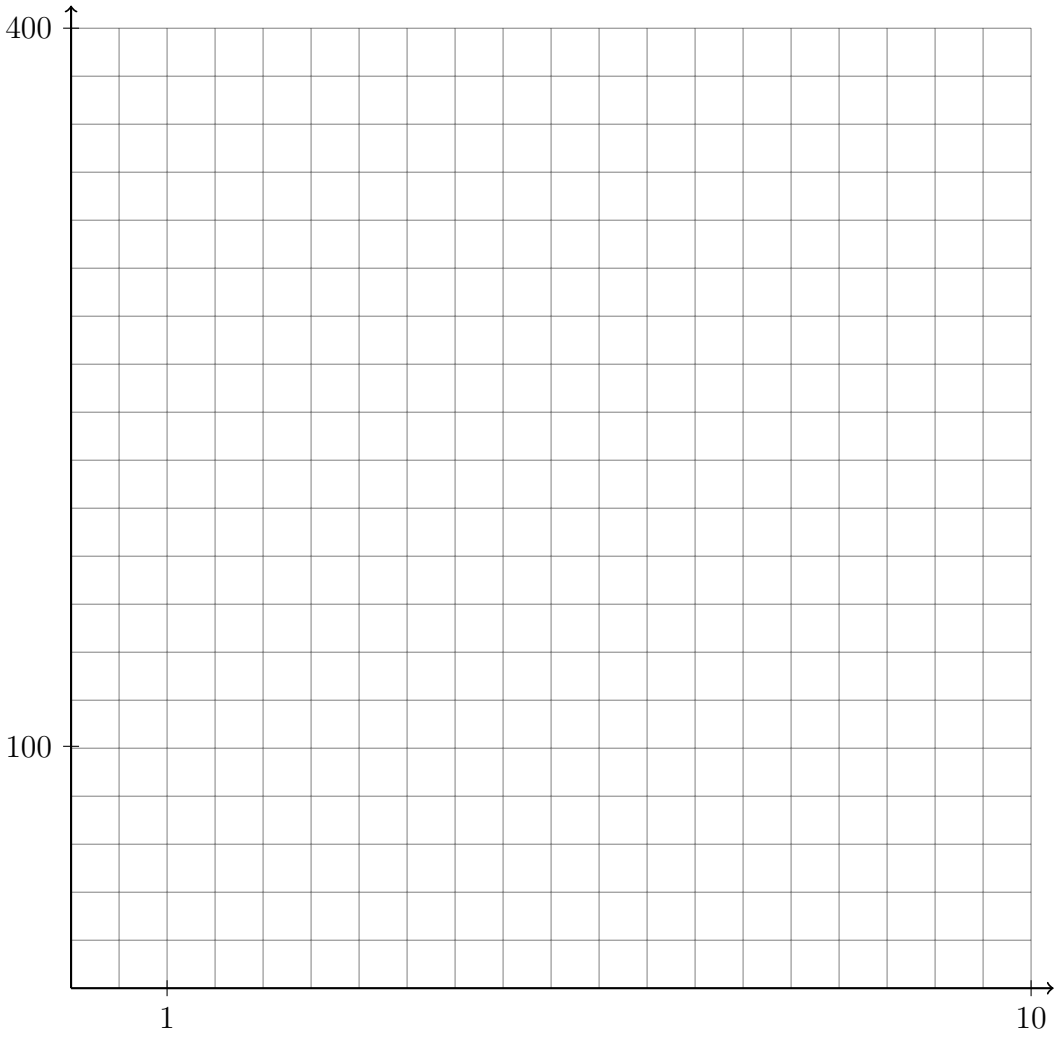
13. Graph $g(x) = 30(1.5)^{\frac{x}{2}} - 5$ on the set of axes below.



Is the function an example of exponential growth or exponential decay? Justify your answer algebraically.

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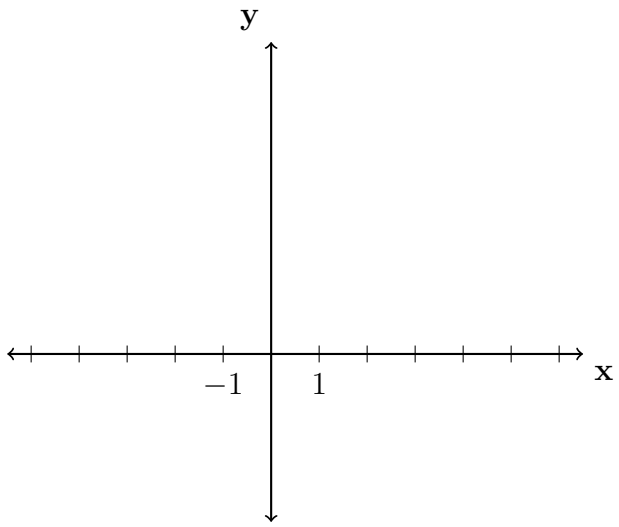
14. The zeros of a quartic polynomial function h with positive leading coefficient are $-5, \pm 3,$ and 6. Sketch a graph of $y = h(x)$ on the grid below, accurately depicting the x-intercepts.

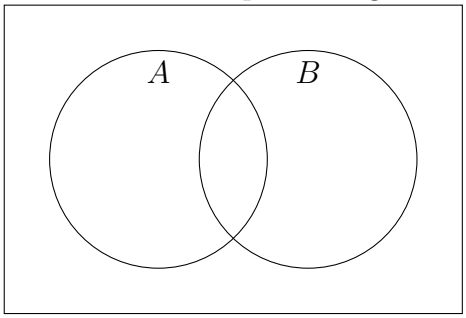


15. Let A and B be independent events, where $\mathrm{P}(A) = 0.5$ and $\mathrm{P}(B) = 0.6$.

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

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

    (c) Shade the area representing $A \cap B'$ in Venn diagram below.



16. Use long division to determine the quotient and remainder of $f(x) = (x^3 + 4x^2 - 8x - 6)$ divided by $g(x) = (x + 2)$. Express your answer as $q(x) + \dfrac{r(x)}{g(x)}$