AP PRECALCULUS · UNIT 1.5 · WORKSHEET VERSION E

Name: _____ Date: _____ Period: _____

1. For $P(x) = 2(x + 5)^2(x - 6)x$, state the degree, all real zeros, and each multiplicity.

2. Factor completely over the real numbers: $P(x) = x^3 - 4x^2 - 47x + 210$.

3. A polynomial has real coefficients and one zero, $5 - 6i$. State the required non-real zero and explain.

4. A real-coefficient polynomial has zeros $x = -5$ (multiplicity 2), $x = 6$, $x = 7i$, and $x = 5 + 6i$. Find its least possible degree.

5. Write a monic polynomial of least degree with real coefficients and zeros $x = -5$ (multiplicity 2) and $x = 6i$.

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6. Given $P(x) = x^3 + 5x^2 + 36x + 180$ and a zero $6i$, find all zeros and factor P over the complex numbers.

7. Find all complex zeros and write a linear factorization: $P(x) = x^3 - 6x^2 + 5x - 30$.

8. Use equal-spaced inputs to identify the degree of this polynomial from its table.

x:	0	1	2	3	4	5
$P(x)$:	4	7	12	31	76	159

9. Classify $f(x) = 5x^6 + 6x^2 - 7$ as even, odd, or neither. Prove using $f(-x)$.

10. The table gives a function defined on these inputs. Classify as even, odd, or neither and justify.

x:	-2	-1	0	1	2
$f(x)$:	-5	-6	0	6	5

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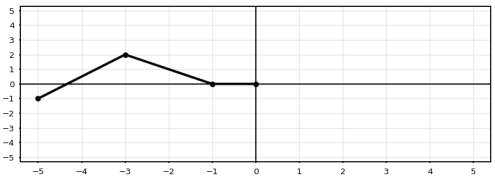
11. An even function h has $h(-4) = 30$, $h(2) = 7$, $h(-1) = -6$. Find $h(4)$, $h(-2)$, $h(1)$.

12. The displayed left-half graph belongs to a(n) odd function. Complete the graph for $0 \le x \le 5$ and list the coordinates of the reflected marked points.



13. An odd function g has $g(-3) = -10$ and $g(5) = 18$. Find $g(3)$, $g(-5)$, and the average rate of change on $[-3, 5]$.

14. Solve $(x + 5)^2(x - 6)(x - 9) \le 0$. Use a sign chart and interval notation.

15. For $f(x) = x^2 + 7$ and $g(x) = 32$, solve $f(x) \ge g(x)$. State the x-intervals where f is on/above g.