

1) $(4 + 2i) - (5 - i) =$

2) $(1 - 3i)(4 + 2i) =$

3) $\sqrt{-25} =$

4) Write the conjugate of $5 + 7i$.

5) $i^{50} =$

6) $\frac{1 + 2i}{3 - i} =$

7) Write $x^2 + 25$ as the product of its complex factors.

8) Draw the graph of a quadratic function which has non-real roots.

9) Rewrite $x^{-\frac{4}{3}}$ in radical notation.

10) Rewrite $3 \cdot \sqrt[5]{x^2}$ in rational exponent notation.

11) $(2x^3 - x^2 + 3) + (5x^2 + x - 8) =$

12) Write a polynomial function in standard form which gives the volume of a box whose height is x , whose length is 4 more than the height and whose width is 2 less than the height.

x	1	2	3	4	5
f(x)	7	1	8	-5	3
g(x)	3	-2	5	1	0

13) $f(g(4)) =$

14) If $f(x) = x^2 - 2x$ and $g(x) = x + 2$, then $f \circ g(x) =$

x	2	3	4	5
$f(x)$	4	5	3	2

15) $f^{-1}(3) =$

16) What is the coefficient of x^3 in the expansion of $(2x-1)^4$?

17) Find the inverse of $p(x) = 2x^2 - 3$ for $x \geq 0$.

18) The cost of producing x units of a product is given by the function $c(x) = 8x^2 - x + 5$. The revenue brought in for x units of the product is given by $r(x) = 14x^2 + 2x + 12$. Write the function giving the net profit, $(r - c)(x)$, for x units of the product.

19) Divide using synthetic division.

$$(2x^3 - x^2 + 4x + 8) \div (x + 1)$$

20) $\frac{28x^4 - 14x^2}{7x^2} =$

21) List the possible Rational Roots of $p(x) = 5x^3 + 6x^2 - 2x - 4$.

22) According to the Fundamental Theorem of Algebra, how many roots does the polynomial $5x^7 + 3x - 6$ have?

23) Use synthetic division and the Remainder Theorem to determine whether $(x + 2)$ is a factor of $f(x) = x^3 + 2x^2 - 4x + 3$.

24) A polynomial has a root of $3 - 6i$. What other number must be a root of this polynomial?

25) Factor $x^2 + 12x + 20$.

26) Factor $4x^2 - 9$.

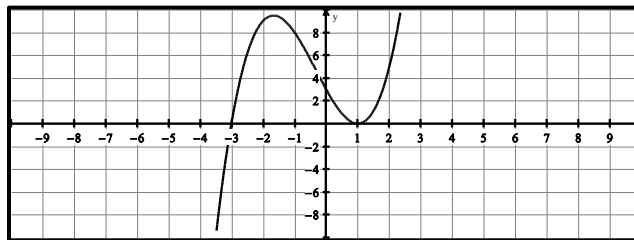
27) Factor $4x^2 - 11x - 3$.

28) What are the roots of the polynomial $p(x) = (x-3)(x+1)(2x-5)$?

29) Use synthetic substitution to find $f(-2)$ if $f(x) = x^3 - x^2 + 6x + 4$.

30) Classify this polynomial by its degree and the number of terms.

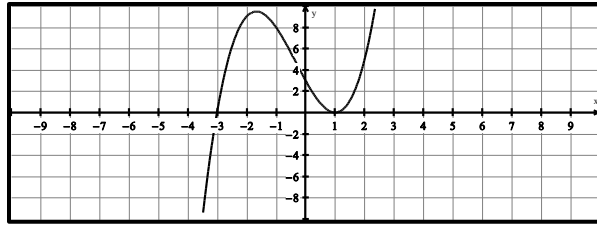
$$x^3 + 6x - 5$$



31) Use the multiplicity of the roots to write a possible equation for the polynomial in the graph above.

32) Explain how to determine the least possible degree of a polynomial by looking at its graph.

33) Draw the graph of a polynomial which is positive only on the interval $(2, 5)$.



34) Describe the end-behavior of the function in the graph above using proper notation.

35) Draw the graph of a polynomial which is increasing only on the interval (2, 5).

36) Describe the end-behavior of $f(x) = -2x^5 + 6x - 5$ using proper notation.

37) Write the equation of a polynomial which has the end-behavior given below.

$$x \rightarrow -\infty, f(x) \rightarrow \infty$$

$$x \rightarrow \infty, f(x) \rightarrow \infty$$

38) Write the equation of a polynomial with 3 terms that has rotational symmetry about the origin.

39) Draw the graph of an even polynomial.

40) Draw the graph of a polynomial which is negative and decreasing at the point $x = 5$.