Name: Class Period:

MATH 1050 Worksheet 3.3A Synthetic Division

1. Use synthetic division to find which point is on the graph:
$f(x) = x^3 + x^2 - 20x$

A. (−1,20)
B. (−1, 10)
C. (−1,13)
D. (−1, 19)

2.

What values of x, when substituted in the expression $x^3 - 11x^2 + 23x + 35$, result in an output of zero?

Ⓐ $7, 5, 1$

Ⓑ $35, 7, -1$

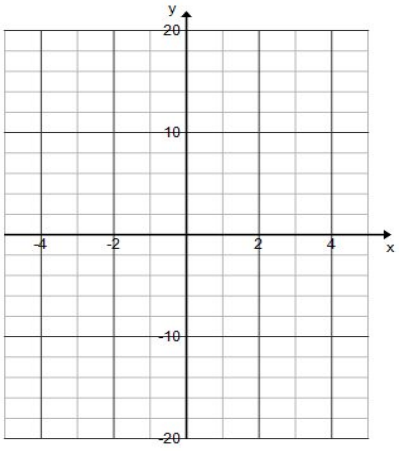
Ⓒ $7, 5, -1$

Ⓓ $5, -1, -7$

3. Use synthetic Division to complete the table, then graph:
$f(x) = x^4 - 40x^2 + 144$

x	y
1	
0	
2	

4. If it is given that there is a zero on the graph at −2. Use synthetic division to find the quadratic to factor, and then list all the zeros from low to high. Sketch a quick graph with the correct x and y-intercepts and shape.
$f(x) = x^3 - 2x^2 - 5x + 6$



5. Divide: $\frac{x^4-4x^2-3x}{x+3}$

6.

Divide.

$\frac{x^3+8x+7}{x+1}, x \neq -1$

Ⓐ $x^2 - x + 9 - \frac{2}{x+1}$

Ⓑ $x^2 - x + 9 - \frac{2}{x^3+8x+7}$

Ⓒ $x^2 + x + 9 + \frac{16}{x+1}$

Ⓓ $x^2 + x + 9 + \frac{16}{x^3+8x+7}$

7.

Polynomial $P(x)$ has a zero at $x = 3$. Which expression must leave a remainder of 0 when divided into $P(x)$?

Ⓐ 3

Ⓑ -3

Ⓒ $x + 3$

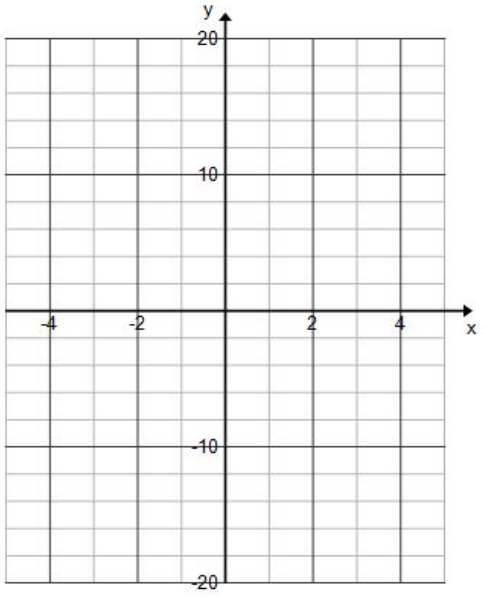
Ⓓ $x - 3$

8. Graph the following by using the remainder theorem to complete the table and graph the points.

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

x	y
−4	
−3	
−2	
0	
1	
2	

9. Graph the points at left.

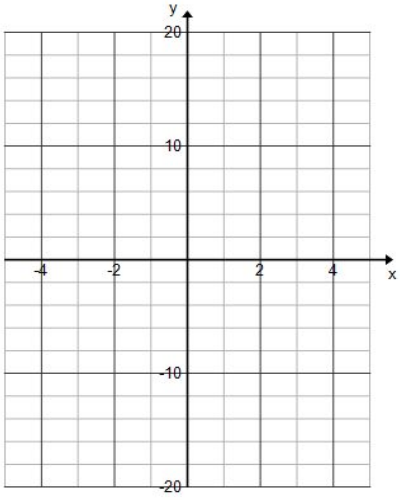


10. Graph the following by using the remainder theorem to complete the table and graph the points.

$f(x) = -x^3 + 2x^2 + 5x - 6$

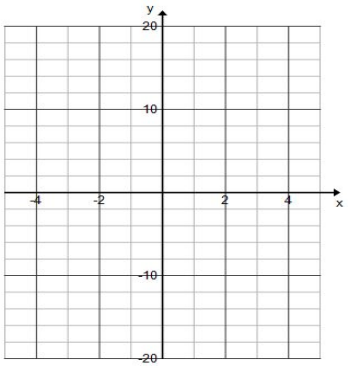
x	y
−3	
−1	
1	
3	
0	

11. Graph table at left.



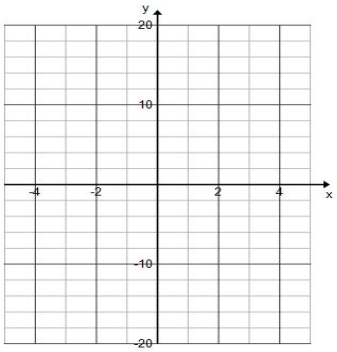
12. If it is given that there is a zero on the graph at 3. Use synthetic division to find the quadratic to factor, and then list all the zeros from low to high. Sketch a quick graph with the correct x and y-intercepts and shape.

$f(x) = 2x^3 - 3x^2 - 14x + 15$



13. If it is given that there is a zero on the graph at −1. Use synthetic division to find the quadratic to factor, and then list all the zeros from low to high. Sketch a quick graph with the correct x and y-intercepts and shape.

$f(x) = -x^3 - 2x^2 + 11x + 12$



14. Simplify:

a. $(4 + \sqrt{-25})(3 - \sqrt{-4})$

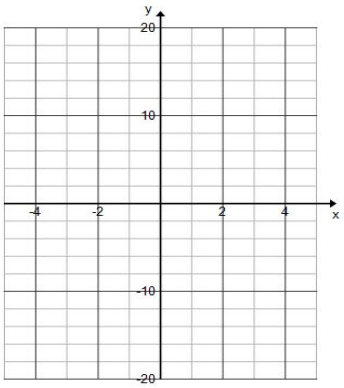
b. $(4 + \sqrt{-25}) - (3 - \sqrt{-4})$

15. Solve with the quadratic Formula:

$x^2 + 1 = -4x$

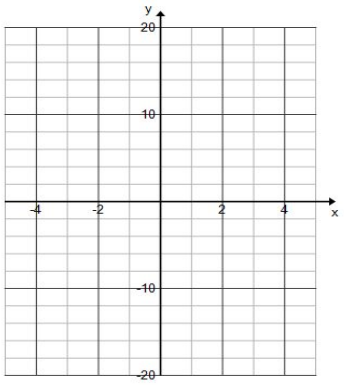
16. If it is given that there is a zero on the graph at 4. Use synthetic division to find the quadratic to factor, and then list all the zeros from low to high. Sketch a quick graph with the correct x and y-intercepts and shape.

$f(x) = -x^3 + 11x^2 - 38x + 40$



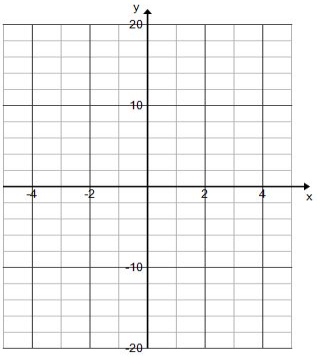
17. If it is given that there is a zero on the graph at -2. Use synthetic division to find the quadratic to factor, and then list all the zeros from low to high. Sketch a quick graph with the correct x and y-intercepts and shape.

$f(x) = x^3 + 9x^2 + 26x + 24$



18. If it is given that there is a zero on the graph at 2. Use synthetic division to find the quadratic to factor, and then list all the zeros from low to high. Sketch a quick graph with the correct x and y-intercepts and shape.

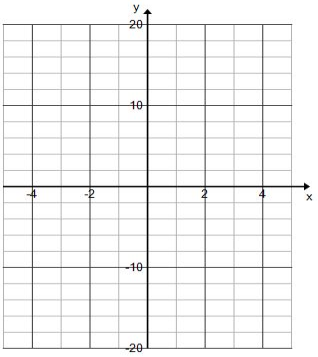
$f(x) = -x^3 - 1x^2 + 6x$



19. Factor and then graph:

$P(x) = x^4 - 27x^2 + 50$

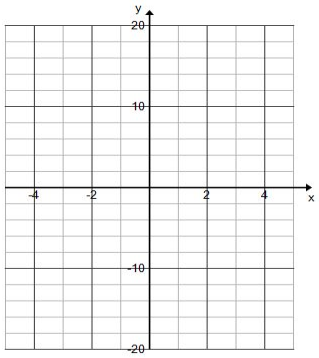
List x-Intercepts and y-Intercept



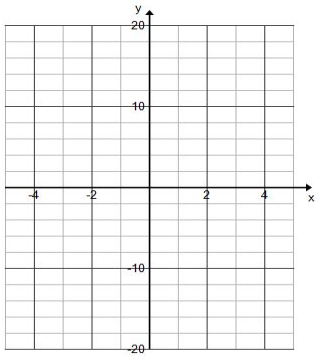
26. Find $f^{-1}(x)$

$f(x) = \frac{2x-1}{3-x}$

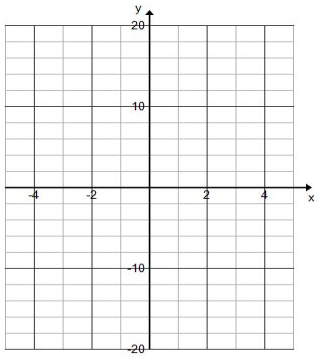
20. Factor and then graph:
$P(x) = x^4 - 12x^3 + 35x^2$
List x-Intercepts and y-Intercept



21. Factor and then graph:
$P(x) = x^4 - x^3 - 1x + 1$
List x-Intercepts and y-Intercept

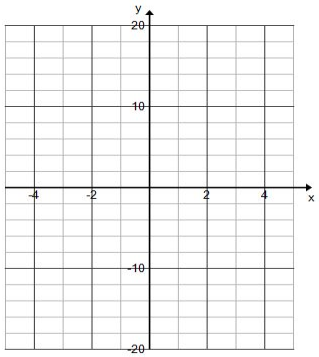


22. Graph. $P(x) = -(x-4)^3(x+2)^2(x-1)$
List x-Intercepts and y-Intercept



23. Determine if the function given is a one-to-one function. (Valid reasoning must be provided to receive credit.)
$f(x) = 2|x-3|+5$

24. Sketch the graph of the following. Write Vertex, Vertex (Standard)Form, X-Intercepts, & y-Intercepts.
$f(x) = 3x^2 + 7x + 2$



25. If $f(x) = 2x - 3$, and $g(x) = \frac{2}{5-x}$
$g \circ f$

Domain of $g \circ f$