

Synthetic Substitution

Finding

Coordinate

Points using

Remainder

From Synthetic

Division

Is $x - 7$ a factor of

$$9x^4 - 27x^3 - 20x^2 - 48x - 64 ?$$

if not what is the coordinate on the function at $x = 7$? $(7, \underline{\quad})$

$$\begin{array}{r|rrrrr} 7 & 9 & -27 & -20 & -48 & -64 \\ & \downarrow & 63 & 252 & 1624 & 11032 \\ \hline & 9 & 36 & 232 & 1576 & 10968 \end{array}$$

$$\left(\frac{7}{x}, \frac{10,968}{y} \right)$$

$$f(7) = 10,968$$

the remainder is the y value

Board Work

1. Evaluate $f(x) = 4x^3 - 2x^2 - 5x + 11$ when $x = -2$

$$f(-2) = -19$$

$$(-2, -19)$$

2. Evaluate $f(x) = 5x^4 + 2x^3 - 20x - 6$ when $x = 2$

$$f(2) = 50$$

$$\begin{array}{r|rrrrr} 2 & 5 & 2 & 0 & -20 & -6 \\ & \downarrow & 10 & 24 & 48 & 56 \\ \hline & 5 & 12 & 24 & 28 & 50 \end{array}$$

$$(2, 50)$$

Assignment

Textbook: pg. 178 # 25-32

Challenge: 35,36,37

25. $f(-1) = 37$

26. $f(3) = 13$

27. $f(2) = 11$

28. $f(-4) = -27$

29. $f(6) = 181$

30. $f(10) = 903$

31. $f(3) = 115$

35.
$$\frac{A}{T} = \frac{-1.95x^3 + 70.1x^2 - 188x + 2150}{14.8x + 725}$$

$$\approx -0.13x^2 + 11.19x - 560.90 + \frac{408,802.53}{14.8x + 725}, 0 < x < 18$$

36.
$$2 \begin{array}{r|rrrr} -6 & 0 & 72 & 0 \\ & -12 & -24 & 96 \\ \hline & -6 & -12 & 48 & 96 \end{array}$$

Because the remainder is 96, this verifies that $P(2) = 96$; yes;
An easier method would be to substitute 2 directly into the equation.

37. A