Secondary III 3-1 HW

Name: Selected Answers

Zeros of a Polynomial

Determine whether the given binomial is a factor of the polynomial $p(x)$. If so, find the remaining factors of $p(x)$.

12. $p(x) = x^3 + 2x^2 - x - 2,\ (x+2)$

13. $p(x) = 2x^4 + 6x^3 - 5x - 10,\ (x+2)$

$+0x^2$

-2	2	6	0	-5	-10
+	↓	-4	-4	8	-6
	2	2	-4	3	$\boxed{-16}$ ← Remainder $\neq 0$

$\boxed{\text{Not a Factor}}$

14. $p(x) = x^3 - 22x^2 + 157x - 360,\ (x-8)$

8	1	-22	157	-360
+	↓	8	-112	360
	1	-14	45	$\boxed{0}$ ← Remainder $=0$

$\boxed{x-8 \text{ is a factor}}$

$x^2 - 14x + 45 = \boxed{(x-5)(x-9)}$

↑ other factors

$-5 \cdot -9 = 45$

$-5 + -9 = -14$

15. $p(x) = 4x^3 - 12x^2 + 2x - 5,\ (x-3)$

7.1 Find all the zeros of the following polynomials

1. $f(x) = x^3 - x^2 - 10x - 8$ Possible zeros: $\pm1, \pm2, \pm4, \pm8$

2. $f(x) = 2x^3 - x^2 - 13x - 6$ Possible zeros: $\pm1, \pm2, \pm3, \pm6, \pm\frac{1}{2}, \pm\frac{3}{2}$

3	2	-1	-13	-6
+	↓	6	15	6
	$2x^2+5x+2$			$\boxed{0}$

$(2x+1)(x+2)$

$-1/2 \quad -2$

$\boxed{\text{zeros: } 3, -\frac{1}{2}, -2}$

3. $g(x) = x^3 - 9x^2 + 23x - 15$ Possible zeros: $\pm1, \pm3, \pm5, \pm15$

1	1	-9	23	-15
+	↓	1	-8	15
	1	-8	15	$\boxed{0}$

$\boxed{\text{zeros: } 1, 3, 5}$

$x^2 - 8x + 15 = (x-5)(x-3)$

$-5 \quad -3$

4. $h(x) = 6x^3 - 7x^2 - 9x - 2$

5. $g(x) = x^4 - 6x^3 + 11x^2 - 6x$

6. $g(x) = x^4 - 5x^2 + 4$ Possible zeros: $\pm1, \pm2, \pm4$

1	1	0	-5	0	4
	↓	1	1	-4	-4
	1	1	-4	-4	$\boxed{0}$
Again: -1	↓	-1	0	4	
	1	0	-4	$\boxed{0}$	

$\boxed{\text{zeros: } 1, -1, -2, 2}$

$(x^3 + x^2) - 4x - 4)$

$x^2(x+1) - 4(x+1)$

$(x^2 - 4)(x+1)$

$x^2 - 4 = (x+2)(x-2)$

$-2 \quad 2$

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Possible zeros!

7. $f(x)=x^3-4x^2-11x+2$ $\pm1, \pm2$

8. $f(x)=x^3-4x^2+2x+4$

-2	1	-4	-11	2
	↓	-2	12	-2
	1	-6	1	0

x^2-6x+1 Not factorable!

Quadratic formula: $\frac{6\pm\sqrt{36-4}}{2} = \frac{6\pm\sqrt{32}}{2}$ $8 < \frac{2}{4}$ 9

zeros: -2, $3\pm2\sqrt{2}$

Irrational

17. Identify the zeroes of $f(x)=(x+3)(x-4)(x-3)$, write the function in standard form, and state how the zeros are related to the standard form.

$f(x)=(x+3)(x-4)(x-3) = (x^2-x-12)(x-3) = x^3-3x^2-x^2+3x-12x+36$

zeros: -3, 4, 3

Standard Form: $x^3-4x^2-9x+36$

The # of zeroes is the same as the degree

19. Explain the Error Sabrina was told to find the zeros of the polynomial function $h(x)=x(x-4)(x+2)$. She stated that the zeros of this polynomial are $x=0$, $x=-4$, and $x=2$. Explain her error.

$h(x) = x(x-4)(x+2)$

Review Look @ Unit 2!

Perform the following operations

1. $(x^2-3x+7)+(3x^2+5x-3)$

2. $(-3x^2-5)-(x^2+7x+12)$

3. $(5x^3-1)^2$ $(5x^3-1)(5x^3-1)$