Bellwork Alg 2A Tuesday, June 13, 2017

1. Three roots of a fourth degree polynomial are 7, –2, and $\sqrt{3}$. Write this polynomial in STANDARD FORM.

2. Simplify. State restrictions on the variable. $\dfrac{x^2+x-2}{2x^3+12x^2+16x} \div \dfrac{4x^2+8x-12}{6x^4+54x^3+120x^2}$

3. Does each table represent Direct Variation, Inverse Variation, or neither?
If it does represent a variation do the following:
• Write a Variation Equation AND • Find the value of x when $y = 150$

a)

X	Y
–8	20
–5	12.5
3	7.5
7.2	–18
13	–32.5

b)

X	Y
–12	–24
–9	–32
–1.5	–192
5	57.6
8	36

c)

X	Y
–15	55.5
–11	40.7
–6	22.2
4	–14.8
19	–70.3

4. Find each quotient. You can leave the remainder any way you wish.

a) $\dfrac{4x^3-11x+18}{x+3}$ b) $\dfrac{6x^3+31x^2+8x-45}{3x+5}$

5. Given 4 and –2 are roots of $y = x^4 - 2x^3 - 15x^2 + 14x + 56$ find the remaining roots.

6. State the degree (actual NUMBER) and leading coefficient (actual NUMBER) of each polynomial.

a) $y = -12x^3 + 7x^2 - 3x^4 + x - 29$ b) $y = -3x(x+6)^2(8-2x)^3(7x+4)(5x-9)^2$

DEG= Leading Coeff= DEG= Leading Coeff=

7. State the end-behavior of each polynomial.

a) $y = -6x^2 + 7x + x^3 + 4$ b) $y = 11x^4 - 34x^3 - x^2 - 10x - 1$ c) $y = x^3(5-x)(x+7)^2$

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Answers

(1)

ROOTS	FACTORS
7	$x-7$
-2	$x+2$
$\pm\sqrt{3}$	x^2-3

$(x-7)(x+2)(x^2-3)$

	x	-7
x	x^2	$-7x$
$+2$	$+2x$	-14

$(x^2-5x-14)(x^2-3)$

	x^2	$-5x$	-14
x^2	x^4	$-5x^3$	$-14x^2$
-3	$-3x^2$	$+15x$	$+42$

$f(x) = x^4 - 5x^3 - 17x^2 + 15x + 42$

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(2)

$$\frac{x^2+x-2}{2x^3+12x^2+16x} \div \frac{4(x^2+2x-3)}{6x^2(x^2+9x+20)}$$

$2x^3+12x^2+16x \rightarrow 2x(x^2+6x+8)$

$$\frac{(x+2)(x-1)}{2x(x+4)(x+2)} \div \frac{4(x+3)(x-1)}{6x^2(x+4)(x+5)}$$

$$\frac{(x+2)(x-1)}{2x(x+4)(x+2)} \cdot \frac{6x^2(x+4)(x+5)}{4(x+3)(x-1)} = \frac{6x^2(x+5)}{8x(x+3)}$$

$$= \frac{3x(x+5)}{4(x+3)}$$

$x \neq 0, -4, -2, -5, -3, 1$

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(3) a) Neither

b) INVERSE VARIATION EQ: $xy = 288$ or $y = \frac{288}{x}$

$x = 1.92$ when $y = 150$

c) DIRECT VARIATION EQ: $y = -3.7x$ or $\frac{y}{x} = -3.7$

$x \approx -40.54$ when $y = 150$

(4) a) -3 | $4 \quad 0 \quad -11 \quad 18$

$\quad\quad -12 \quad 36 \quad -75$

$4 \quad -12 \quad 25 \quad -57$

$4x^2 - 12x + 25 \quad R = -57$

b) $3x+5 \;\overline{)\; 6x^3 + 31x^2 + 8x - 45}$

$2x^2 + 7x - 9$

$-(6x^3 + 10x^2)$

$21x^2 + 8x$

$-(21x^2 + 35x)$

$-27x - 45$

$-(-27x - 45)$

0

$2x^2 + 7x - 9$

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(5) 4 | $1 \quad -2 \quad -15 \quad 14 \quad 56$

$\quad\quad 4 \quad 8 \quad -28 \quad -56$

$1 \quad 2 \quad -7 \quad -14 \quad 0$

-2 | $1 \quad 2 \quad -7 \quad -14$

$\quad\quad -2 \quad 0 \quad 14$

$1 \quad 0 \quad -7 \quad 0$

$x^2 - 7 = 0$

$x^2 = 7$

$x = \pm\sqrt{7}$

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(6) a) DEG $= 4$

L.C. $= -3$

b) DEG $= 1+2+3+1+2 = 9$

L.C. $= (-3)(1)(-2)^3(7)(5)^2$

$= 4200$

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(7) a) pos odd $(\swarrow, \nearrow)$

b) pos even $(\uparrow, \nearrow)$

c) neg even $(\swarrow, \searrow)$