

# Bellwork Alg 2A Wednesday, May 10, 2017

1. Is each a polynomial? If no, identify ALL parts that are the reason.

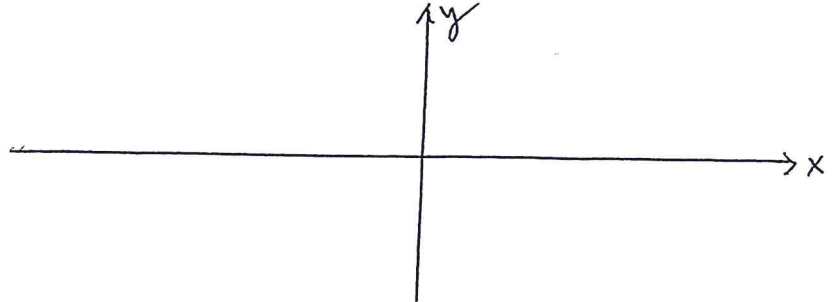
a)  $f(x) = -12x^{\frac{3}{2}} - 6x^{-3} + 4x^2 + \frac{9}{x} + 6$

b)  $y = 1.35x^5 + \frac{4}{7}x^3 - 0.092x + \sqrt{6}$

c)  $y = 37x^6 + 2ix^4 - 9\sqrt{x} + 1$

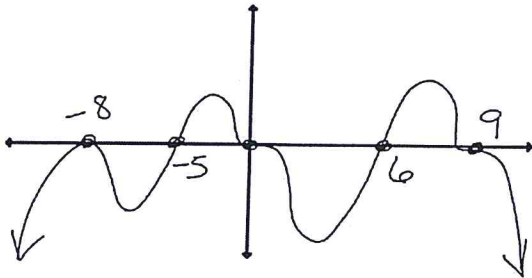
2. Graph this polynomial. Make sure you show the proper end behavior and shape at each zero.

$y = -x^2(x+7)(4-x)^3(x+3)^3$



3. Given 2 and -3 are roots of  $y = x^4 - 3x^3 + 19x^2 + 53x - 174$  find the other two roots.

4. Write the EXACT equation of this polynomial, with the correct value of  $a$  if it passes through  $(-4, 89989120)$ .



5. Make a list of all possible rational roots of this polynomial:  $y = 4x^3 - 15x^2 - 7x + 12$

6. Two roots of a cubic are -3 and  $\sqrt{7}$ . Write the equation of this cubic in Standard Form.

1. Is each a polynomial? If no, identify ALL parts that are the reason.

a)  $f(x) = -12x^{\frac{3}{2}} - 6x^{-3} + 4x^2 + \frac{9}{x} + 6$  No

b)  $y = 1.35x^5 + \frac{4}{7}x^3 - 0.092x + \sqrt{6}$  Yes

c)  $y = 37x^6 + 2ix^4 - 9\sqrt{x} + 1$  No

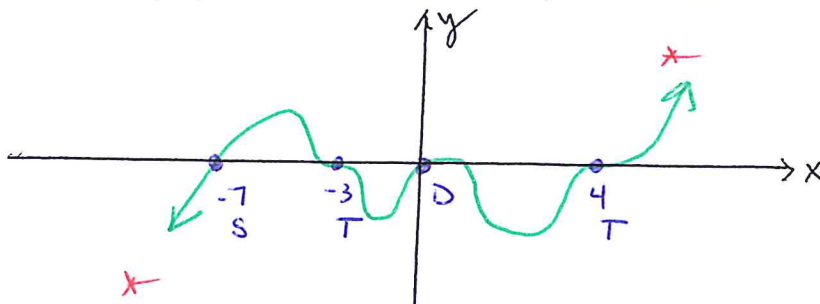
2. Graph this polynomial. Make sure you show the proper end behavior and shape at each zero.

$y = -x^2(x+7)(4-x)^3(x+3)^3$

- + - +

pos odd

(↓, ↑)



3. Given 2 and -3 are roots of  $y = x^4 - 3x^3 + 19x^2 + 53x - 174$  find the other two roots.

$$\begin{array}{r|rrrrr} 2 & 1 & -3 & 19 & 53 & -174 \\ & & 2 & -2 & 34 & 174 \\ \hline & 1 & -1 & 17 & 87 & 0 \end{array}$$

$$\begin{array}{r|rrrr} -3 & 1 & -1 & 17 & 87 \\ & & -3 & 12 & -87 \\ \hline & 1 & -4 & 29 & 0 \end{array}$$

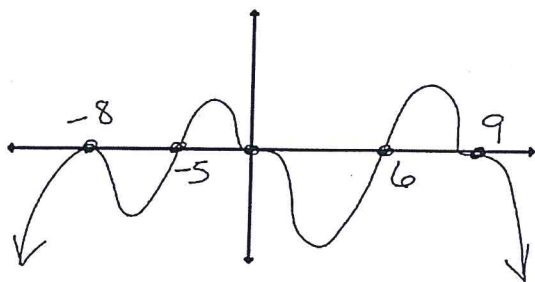
$x^2 - 4x + 29$

$$\frac{4 \pm \sqrt{-100}}{2}$$

$$\frac{4 \pm 10i}{2}$$

OTHER TWO ROOTS ARE  $2 \pm 5i$

4. Write the EXACT equation of this polynomial, with the correct value of  $a$  if it passes through  $(-4, 89989120)$ .



$$y = ax^3(x+8)^2(x+5)(x-6)(x-9)^3$$

$$89989120 = a(-4)^3(4)^2(1)(-10)(-13)^3$$

$$\frac{89989120}{-22497280} = \frac{-22497280a}{-22497280}$$

$$a = -4$$

$$y = -4x^3(x+8)^2(x+5)(x-6)(x-9)^3$$

5. Make a list of all possible rational roots of this polynomial:  $y = 4x^3 - 15x^2 - 7x + 12$

$$\frac{\text{FACTORS OF 12}}{\text{FACTORS OF 4}} = \frac{\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12}{\pm 1, \pm 2, \pm 4}$$

$$= \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12, \pm \frac{1}{2}, \pm \frac{3}{2}, \pm \frac{1}{4}, \pm \frac{3}{4}$$

6. Two roots of a cubic are  $-3$  and  $\sqrt{7}$ . Write the equation of this cubic in Standard Form.

$-3$  comes from  $(x+3)$   
 $\pm\sqrt{7}$  come from  $(x^2-7)$

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

$$x^3 + 3x^2 - 7x - 21$$

|       |       |         |
|-------|-------|---------|
|       | $x$   | $+3$    |
| $x^2$ | $x^3$ | $+3x^2$ |
| $-7$  | $-7x$ | $-21$   |