

**Alg2Trig**  
**Unit 4 Practice Quiz #2**

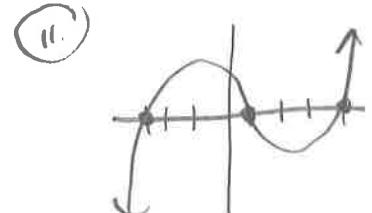
Name: *Key*  
Date:

**I. Use the Remainder/Factor Theorems to prove that the given number is a zero of the polynomial.**

1.  $f(x) = x^3 + 3x^2 - 34x + 48 ; 3$
2.  $f(x) = 3x^3 - 16x^2 + 3x + 10 ; 5$

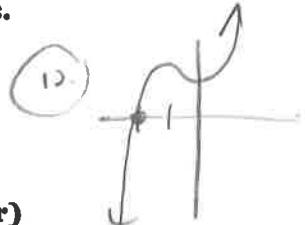
**II. Find all the zeros (x-ints) of the following polynomials.**

3.  $f(x) = x^3 - 8x^2 + 5x + 14$
4.  $f(x) = x^3 + x^2 - 13x + 3$
5.  $f(x) = x^3 + 2x^2 - 34x + 7$
6.  $f(x) = x^4 - 3x^2 - 4$
7.  $f(x) = x^4 - 4x^3 + 4x - 1$



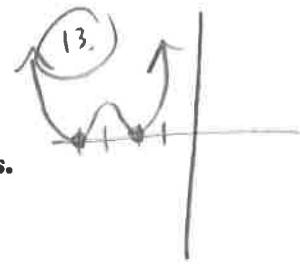
**III. Write the polynomial of least degree with the following zeros.**

8. 3, 5, -1
9. 2, i, -i
10. -1, 2 + i, 2 - i



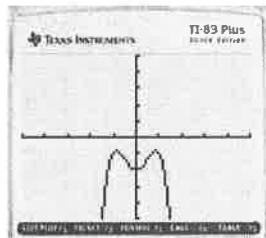
**IV. Graph each function and plot any x-ints. (Use your calculator)**

11.  $f(x) = \frac{1}{10}(x+3)(x-1)(x-4)$  x-int(s):  $-3, 1, 4$
12.  $f(x) = (x+2)(x^2 - x + 1)$  x-int(s):  $-2$
13.  $f(x) = 2(x+2)^2(x+4)^2$  x-int(s):  $-2, -4$



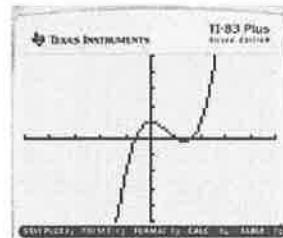
**V. Estimate the zeros AND the ordered pairs of any mins or maxs.**

14.



x-int(s): ~~X~~ min(s):  $(0, -2)$  max(s):  $(-1, 1)$   
 x-int(s):  $(-1, -1)$  min(s):  $(0, -2)$  max(s):  $(1, 0)$

15.



x-int(s):  $-1.5$  min(s):  $(1.5, 0)$  max(s):  $(0, 1)$   
 x-int(s):  $1.5$  min(s):  $(-1.5, 0)$  max(s):  $(1.5, 0)$

**VI. Use your calculator to estimate the zeros and the ordered pairs of any mins or maxs.**

16.  $f(x) = -\frac{1}{3}x^3 + x - \frac{2}{3}$
17.  $f(x) = x^5 - 6x^3 + 9x$
18.  $f(x) = x^4 - 2x^3 - 3x^2 + 5x + 2$

x-int(s):  $-2, 1$  min(s):  $(-1, 1.33)$  max(s):  $(1, 0)$   
 x-int(s):  $0, -1.33$  min(s):  $(1.33, 0)$  max(s):  $(-1.33, 0)$   
 x-int(s):  $1.33$  min(s):  $(-1.33, 0)$  max(s):  $(1.33, 0)$   
 $-1.53$   $(1.99, -0.03)$   $(-0.1, 3.02)$   
 $-0.35$   $(-1.05, -1.03)$   
 $1.33$

**Alg2Trig**  
**Unit 4 Practice Quiz**

Name: Daddy  
Date:

**I. Find the domain.**

1.  $f(x) = x^2 - 3x - 1$

D:  $\mathbb{R}$

2.  $f(x) = \frac{5}{x+3} \quad x \neq -3$

D:  $(-\infty, -3) \cup (-3, \infty)$

3.  $f(x) = \sqrt{x^2 - 3}$

D:  $(-\infty, -\sqrt{3}] \cup [\sqrt{3}, \infty)$

4.  $f(x) = \frac{x}{\sqrt{x-3}}$

D:  $(3, \infty)$

$$\begin{aligned} x^2 - 3 &= 0 \\ x &= \pm\sqrt{3} \end{aligned}$$

$$\begin{array}{c} + \\ - \\ -\sqrt{3} \end{array}$$

$$\begin{array}{c} + \\ - \\ 3 \end{array}$$

**II. Find the inverse.**

5.  $y = \frac{1}{3}x - 5$

$$\begin{aligned} x &= \frac{1}{3}y + 5 \\ x+5 &= \frac{1}{3}y \end{aligned}$$

$y = 3x + 15$

6.  $f(x) = \sqrt{x+1}$

$$\begin{aligned} x &= \sqrt{y+1} \\ x^2 &= y+1 \end{aligned}$$

$y = x^2 - 1$

7.  $f(x) = 2x^3 - 7$

$$\begin{aligned} x &= 2y^3 - 7 \\ x+7 &= 2y^3 \end{aligned}$$

$y = \sqrt[3]{\frac{x+7}{2}}$

**III. Use compositions to check for inverses.**

8.  $f(x) = \frac{1}{2}x^3 - 2$  and  $g(x) = \sqrt[3]{2x+4}$

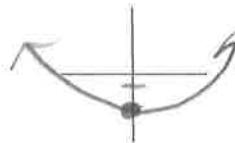
$$\begin{aligned} \frac{1}{2}(\sqrt[3]{2x+4})^3 - 2 &= \sqrt[3]{2(\frac{1}{2}x^3 - 2)} + 4 \\ \frac{1}{2}(2x+4) - 2 &= \sqrt[3]{x^3} \\ x &= x \end{aligned}$$

9.  $f(x) = x^2 - 1$  and  $g(x) = x - 3$

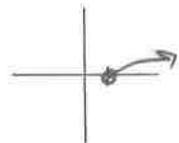
$$\begin{aligned} (x-3)^2 - 1 &= (x^2 - 1) - 3 \\ x^2 - 6x + 8 &= x^2 - 4 \end{aligned}$$

**IV. Graph the following using your knowledge of transformations.**

10.  $y = \frac{1}{2}x^2 - 2$



11.  $y = 3\sqrt{x-1}$



12.  $y = -|x+2| - 3$



13.  $y = -(x+1)^3 + 2$



**V. Find the end behavior.**

14.  $y = 2x^4 - 3x^2 - x - 1$



15.  $y = x^4 - 3x^3 + 4x^5 - 2x + 1$



16.  $y = -x^5 - 4x + 1$



**VI. Use long or synthetic division.**

17.  $(2x^4 - 3x^2 - x - 1) \div (x^2 + 1)$

$2x^2 - 5 \quad R: -x+4$

19.  $(2x^4 - 3x^3 - 2x^2 + 5x + 1) \div (x + 3)$

$$\begin{array}{r} 2x^3 - 9x^2 + 25x + 70 \\ \hline -3 | 2 \ 3 \ -2 \ 5 \ 1 \\ \quad -6 \ 27 \ -75 \ 210 \\ \hline \quad 2 \ -9 \ 25 \ -70 \ 211 \\ \quad 2x^3 - 9x^2 + 25x + 70 \ R: 211 \end{array}$$

18.  $(x^3 - 3x - 1) \div (x^2 - x - 1)$

$x+1 \quad R: -x$

20.  $(x^3 - 9x^4 + 2x + 2) \div (x - 2)$

$$\begin{array}{r} 2x^2 - 9x^3 + 17x^2 - 34x - 66 \quad R: 130 \\ \hline -2 | 1 \ 0 \ 2 \ 2 \\ \quad -2 \ 18 \ -34 \ -68 \ -132 \\ \hline \quad -9 \ -17 \ -34 \ -66 \ 130 \\ \quad -9x^3 - 17x^2 - 34x - 66 \ R: 130 \end{array}$$