Check your HW if it is done.

Help on HW

Then, once your solutions are turned in , pick up the Warm Up

1. Determine the quadratic function if its roots are $-1 \pm 3i$

sum: $-1+3i + -1-3i$ -2

product: $(-1+3i)(-1-3i)$

$1-9i^2$

$1+9$

10

$y = x^2 + 2x + 10$

the alternative

$$y = [X - \text{root} \quad][X - \text{root} \quad]$$

FYI

$$y = [x - (-1+3i)][x - (-1-3i)]$$ ← the alternative

$$y = [x + 1 - 3i][x + 1 + 3i]$$

	x	1	$3i$
x	x^2	x	$\cancel{3ix}$
1	x	1	$\cancel{3i}$
$-3i$	$\cancel{-3ix}$	$\cancel{-3i}$	9

← $-3i \cdot 3i$
$-9i^2$

$$y = x^2 + 2x + 10$$

$$y = [x - (1+3i)][x - (1-3i)]$$ ← the alternative

$$y = [x - 1 - 3i][x - 1 + 3i]$$

	x	-1	$3i$
x	x^2	$-x$	$3ix$
-1	$-x$	1	$-3i$
$-3i$	$-3ix$	$3i$	$-9i^2 = 9$

$y =$

2) Using completing the square, find the zeros of the quadratic function:

$$f(x) = x^2 - 2x + 18$$

$$x^2 - 2x + 18 = 0$$ ← root equation

$$x^2 - 2x = -18$$

expected to show :)

$$x^2 - 2x + 1 = -18 + 1$$

$$\sqrt{(x-1)^2} = \sqrt{-17}$$

$$x - 1 = \pm i\sqrt{17}$$

$$x = 1 \pm i\sqrt{17}$$

$1 + i\sqrt{17}$

$a \pm bi$

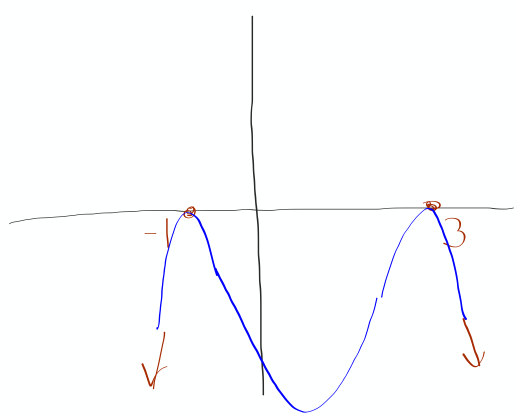
3) For $y = -2(x+1)^2(x-3)^2$:

a) what would be leading term ? $-2x^4$

b) what is the degree ? 4

c) Orientation (-) Is the right side down or up ? ↓

d) what is the end behavior ? ↑↑ ↙↓ ↑↓ ↓↑



4) The x-intercepts of a 2nd degree polynomial are $x = \frac{2}{3}$ and $x = 5$. Find ~~a~~ two possible quadratic function?

$y = -\left(-x+\frac{2}{3}\right)\left(-x+5\right)$

$y = \left(x - \frac{2}{3}\right)\left(x - 5\right)$

$\boxed{y = \left(x - \frac{2}{3}\right)\left(x - 5\right)}$

or

$3x - 2 = 0$

$y = 3\left(x - \frac{2}{3}\right)\left(x - 5\right)$

$\boxed{y = (3x - 2)(x - 5)}$

Be prepared to turn in your notebook at anytime over the next week.

Final Exam

[your next and last test]

ch 5, 6, 7	Ch 8

MON, Tues } June 17+18

30 + 90

Which is bigger ???

- i^2 or $i^{\frac{2}{3}}$

HW Questions

•

$\boxed{87c}$ roots -2 $\sqrt{7}$ $-\sqrt{7}$

$y = (x+2)(x-\sqrt{7})(x+\sqrt{7})$

88a $y = 2x^2 + 5x + 4$

$a = 2$
$b = 5$
$c = 4$

$$x = \frac{-(5) \pm \sqrt{(5)^2 - 4(2)(4)}}{2(2)}$$

Discriminate

$b^2 - 4ac$

$$x = \frac{-5 \pm \sqrt{-7}}{4}$$

if negative 2 complex roots

if positive 2 real roots

if 0 1 real roots

$x =$

93a

$3^x = 17 \rightarrow x = \log_3 17$

$$\log 3^x = \log 17$$

$$x \cdot \log 3 = \log 17$$

$$x = \frac{\log 17}{\log 3}$$

Today

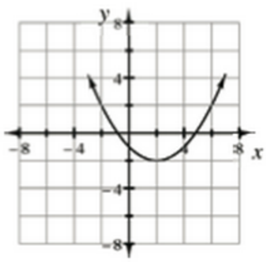
Analyze Roots and Factors of Polynomials

will be on handouts

JUST watch

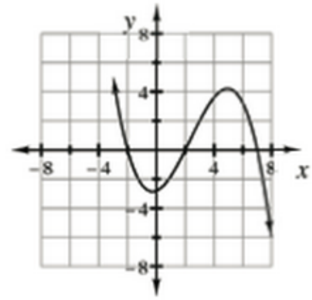
8-100. Based on the following graphs, how many *real* roots does each polynomial function have?

a.



2 real roots

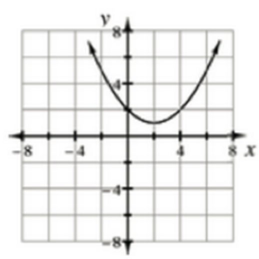
b.



3 real roots

Graphs (a) and (b) above have been vertically shifted to create graphs (c) and (d) shown below. How many *real* roots does each of these new polynomial functions have?

c.

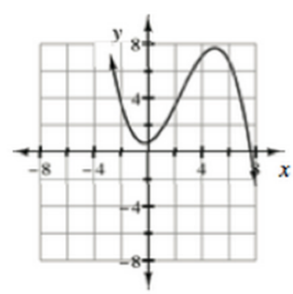


2 non-real roots

2 complex roots

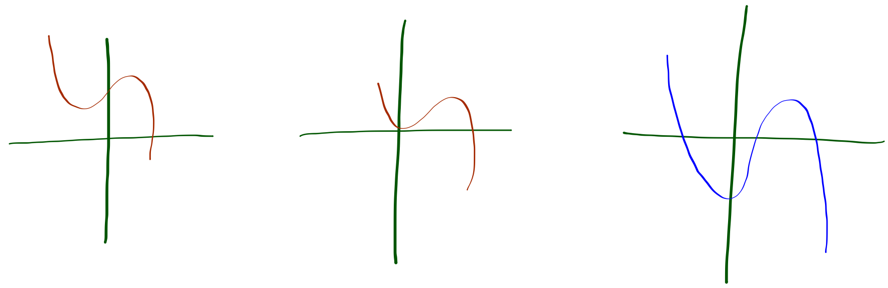
~~2 imaginary~~

d.



1 real root

2 non-real



Sketch a graph of a 3rd degree function
- one with 1 x-intercept
- One with 2 x-intercepts
- One with 3 x-intercepts

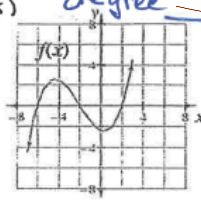
Determine the # of roots, and their type

CLASSWORK 8.2.3

1

f(x) degree 3

a)



f(x) will have 3 real roots (all single roots)

therefore it has..

↓

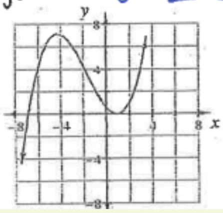
3 linear factors

f(x) =

f(x) = (LF)(LF)(LF)

g(x) degree 3

b)



g(x) will have

therefore it has...

2 real roots → 3 linear factors

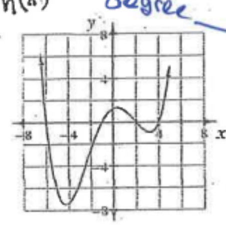
(1 single root)

1 double

$(x+7)(x-1)^2$

h(x) degree 4

c)



h(x) will have

therefore it has...

4 real roots → 4 linear factors

K(x) degree 3

d)

K(x) will have

therefore it has...

1 real root → 1 linear factor

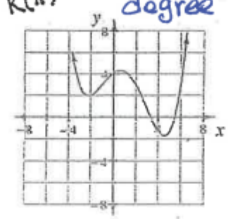
2 non-real roots → 1 quadratic factor

K(x) = (LF)(QF)

$-1+3i$ $-1-3i$

y =

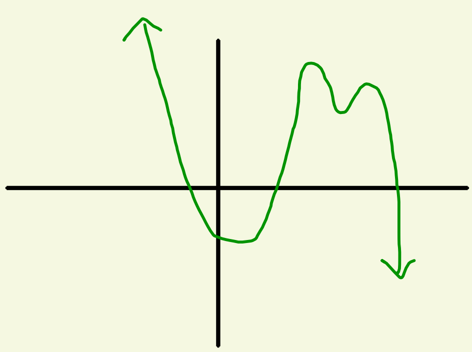
e) R(x) degree 4



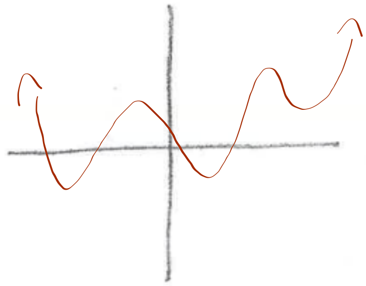
R(x) will have
therefore it has...

2 real roots → 2 linear factors

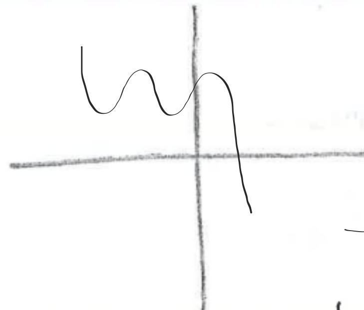
2 non-real roots → 1 Q factor



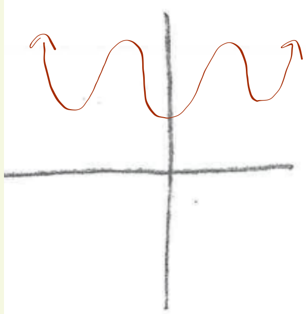
$\boxed{2}$ Make a sketch of a function with indicated number of roots



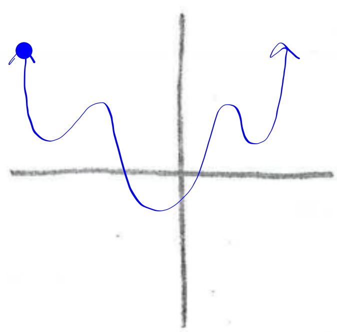
4 real roots
but degree 6



1 real roots and
4 imaginary (complex) roots



6 complex roots
(No real roots)



4 complex and
2 real

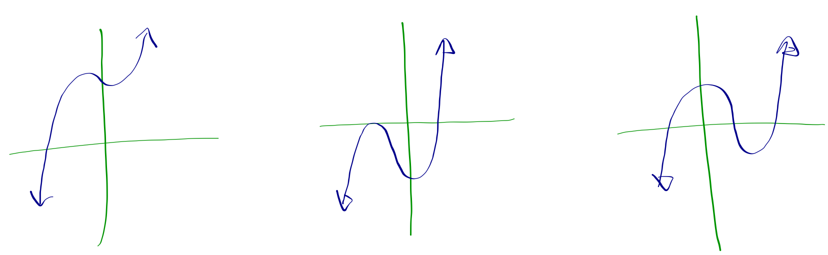
8-102

together

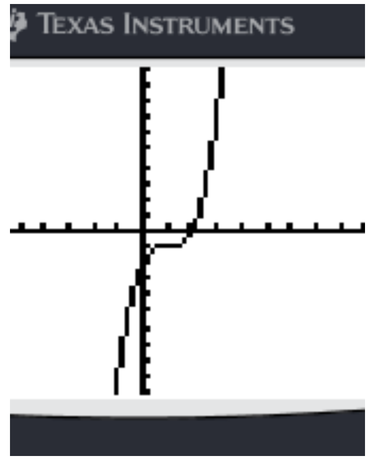
$\boxed{102}$ graph of $y = x^3 - 3x^2 + 3x - 2$.

a. How many real solutions could $x^3 - 3x^2 + 3x - 2 = 0$ have?

1, 2, or 3



it turns out
it only has
1 x-intercept



b. Check to verify that $x^3 - 3x^2 + 3x - 2 = (x - 2)(x^2 - x + 1)$

	x^2	$-x$	1
x			
-2			

b. Check to verify that $x^3 - 3x^2 + 3x - 2 = (x-2)(x^2 - x + 1)$

	x^2	$-x$	1
x	x^3	$-x^2$	x
-2	$-2x^2$	$2x$	-2

c. Find all of the solutions of $x^3 - 3x^2 + 3x - 2 = 0$.

$$x^3 - 3x^2 + 3x - 2 = (x-2)(x^2 - x + 1)$$

How many real roots and how many non-real roots (complex)?

d. How many x-intercepts does $y = x^3 - 3x^2 + 3x - 2$ have?

B.B.

LCQ
(#2 in Ch. 8)

assignment

8....... 105-107, 111-112

algebraically

Period 4
Make sure your name is on your notebook. Turn-it in before you leave today. Sticky note at beginning of Ch. 5