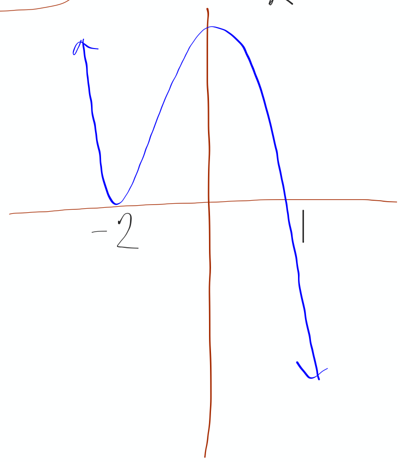
HW help

HW

Questions

54)

shown in book



$\boxed{57b}$ $x = -\sqrt{5}$ $x = \sqrt{5}$

determine a polynomial

$y = (x - \quad)(x - \quad)$

$x+8$

55

b $-5x^3+10x^2+8$

$a_3=-5$ $a_2=10$ $a_1=0$ $a_0=8$

f $y=10$

$a_0=$

60

a $2^x=17$

$x\log(2)=\log(17)$

$x=\dfrac{\log(17)}{\log(2)}$

$\boxed{59\ b}$

$x^2 + y^2 + 10y = -9$ is a circle because of the x^2 and y^2 term

$x^2 \quad y^2 + 10y = -9$ Gather like terms

$\left(\frac{10}{2}\right)^2 = 25$ 25

$x^2 + \underbrace{y^2 + 10y + 25} = 16$

$x^2 + (y+5)^2 = 16$

center $(0, -5)$
radius $= \sqrt{16} = 4$

$\sqrt{5-2x} + 7 = 4$

$\left(\sqrt{5-2x}\right)^2 = (-3)^2$

$5 - 2x = 9$
$-5 \qquad -5$

$-2x = 4$

$x = -2$

$\boxed{\text{Good}}$ $4^{\boxed{\log_4(x)}} = 7$ Abstract!

Covert to log form $\rightarrow$ exponent $= \log_4(7)$

$\log_4(x) = \log_4(7)$

$x = 7$

62

$$f(x) = a_n x^n + (a_{n-1})x^{n-1} + \dots + (a_1)x^1 + a_0$$

$\boxed{55a}$

$$6x^4 - 3x^3 + 5x^2 + x + 8$$

coefficients a_4

a_3

a_2

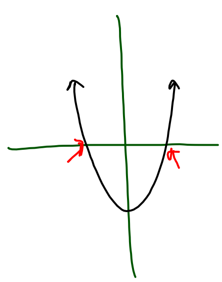
a_1

a_0

$\boxed{63}$ $x^2 = 2$

you get two solutions

2 x-intercepts if graphed



$$x^2 = 2$$

$$\sqrt{} \quad \sqrt{}$$

$$x = \pm\sqrt{2}$$

Pick Up the Warm Up

a. Consider the equation $\boxed{x^2 = 2.}$ How do you "undo" squaring a number?

$-2 \quad -2$

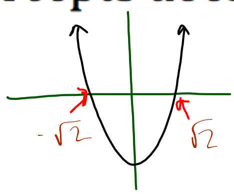
$x^2 - 2 = 0$

b. When you solve $x^2 = 2$, how many solutions should you get?

$x = \pm\sqrt{2}$

you get two solutions

c. How many x-intercepts does the graph of y = $x^2 - 2$ have?



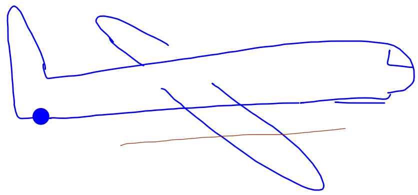
$y = x^2 - 2$

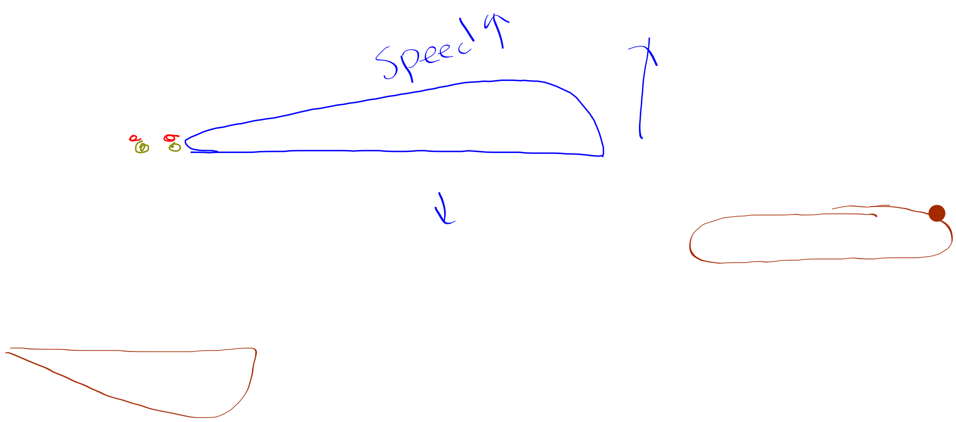
d. Solve the equation $x^2 = 2$. Write your solutions both as radicals and as decimal approximations.

$$x^2 = 2$$

$$\sqrt{} \quad \sqrt{}$$

$$x = \pm\sqrt{2} \approx \pm 1.4142$$




Speed ↑

NOTES on imaginary numbers

$$x^2 + 1 = 0$$

$$x^2 = -1$$

$$\sqrt{} \quad \sqrt{}$$

$$x = \pm\sqrt{-1}$$ impossible

Notes

$$\boxed{\text{definition \#1} \quad \sqrt{-1} = i}$$

Solve $x^2 + 1 = 0$

$$x^2 = -1$$

$$\sqrt{} \quad \sqrt{}$$

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

1 i

$$x = \pm i$$

$x = i$ or $-i$

examples

$\sqrt{-2} \rightarrow i\sqrt{2}$

$\sqrt{2}\cdot\sqrt{-1}$

$\sqrt{2}\,i$

$\sqrt{-10} \rightarrow i\sqrt{10}$

$\sqrt{-9} \rightarrow i\sqrt{9} \rightarrow 3i$

$\sqrt{-12} \rightarrow i\sqrt{12} \rightarrow i\sqrt{4}\sqrt{3} \rightarrow 2i\sqrt{3}$

definition 2

$i^2 = -1$

i

$i^2 = -1$

$i^3 = i^2\cdot i = -i$

$i^4 = i^2\cdot i^2 = -1\cdot -1 = 1$

$i^5 = i^4\cdot i^1 = \boxed{i}$

$i^6 = i^4\cdot i^2 = \boxed{-1}$

$i^7 = i^4\cdot i^3 = i^4\cdot i^2\cdot i = \boxed{-i}$

$i^8 = i^4\cdot i^4 = \boxed{1}$

$$i^{11} = \cancel{i^4} \cdot \cancel{i^4} \cdot i^3 = i^2 \cdot i = -i$$

$i =$

$i^2 =$

$i^3 =$

$i^4 =$

$i^5 =$

$i^{10} =$

$i^{16} =$

$\sqrt{-25}$

$\downarrow$

$i\sqrt{25}$

$\downarrow$

$5i$

$(4i)(4i)$

$16i^2$

$\downarrow$

-16

$(2i)(3i)$

$\downarrow$

$6i^2$

-6

$(2i)^2(-5i)$

$4i^2 \cdot -5i$

$4(-1) \cdot -5i$

$20i$

$x^2-7x+16=0$

$5i(2i-3)$

$10i^2 - 15i$

-1

$-10-15i$

$-15i-10$

$\dfrac{6 \pm \sqrt{-8}}{2}$

$i\sqrt{8}$

$i\sqrt{4}\sqrt{2}$

$2\sqrt{2}$

$\dfrac{6 \pm 2i\sqrt{2}}{2}$

$3 \pm i\sqrt{2}$

Complex Numbers

$a \pm bi$

real part

imaginary part

$7 \pm 3i$

$\sqrt{2} \pm 5i$

$4 \pm i\sqrt{6}$

$\pm 6i$

HAPPY FACE

$(5+i)(5+i)$

$(\sqrt{7}+i)(\sqrt{7}-i)$

$(5+i)(5+i)$

$25 + i^2 + 10i$

$24 + 10i$

$a+bi$

Conjugates

$(4+i)(4-i)$

$16-i^2$

$16-(-1)$

$\boxed{17}$

$(-6+3i)(-6-3i)$

$36-9\underset{(-1)}{i^2}$

$36+9$

$\boxed{45}$

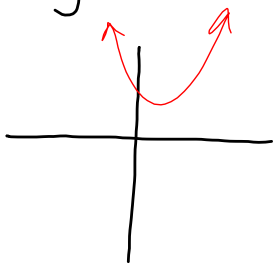
GDC

$2i(\sqrt{7} - 6)$

Some equations
have imaginary
solutions

8 - 66
page 391

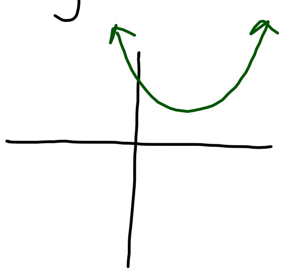
(a) $y = x^2 - 4x + 5$



$x^2 - 4x + 5 = 0$

should not have real solutions

(a) $y = x^2 - 4x + 5$



$x^2 - 4x + 5 = 0$

should not have real solutions

(b) Quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(\;)}}{2(1)}$$

$a = 1$

$b = -4$

$c = 5$

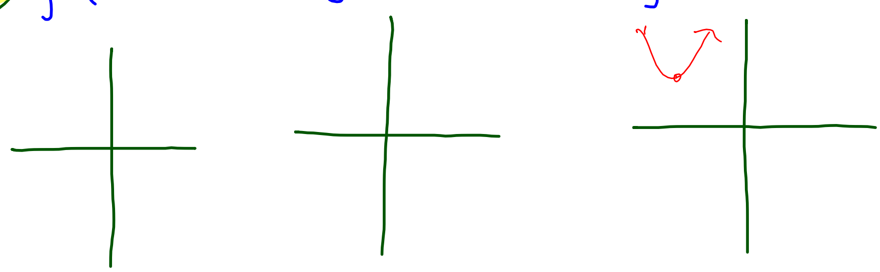
$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(5)}}{2(1)} =$$

BB

$\boxed{8\text{-}67}$

the vocabulary of the question is important.

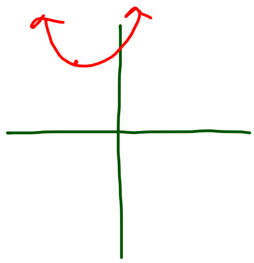
a $y=(x+3)^2-4$ b $y=(x+3)^2$ c $y=(x+3)^2+4$



roots

roots are:

(c) $y=(x+3)^2+4$ $(x+3)^2+4=0$



imaginary roots

Assignment

8.....Read the Math Notes on page 392

.....70 to 78

Yes, many of the assignments have been long. The practice is important for your mastery as well as success on the Final Exam.