Test Notes

ch2B

imaginary #s

R1 → i
R2 → $i^2 = -1$
R3 → $i^3 = -i$
R0 → $i^4 = 1$

ex1 $i^{23} = -i$

$23/4 = 5R3$

ex2 $\sqrt{-75}$

$\sqrt{25}\ \sqrt{3}\ \sqrt{-1}$

$5i\sqrt{3}$

operations

add/sub: combo like terms

ex3 $(4+5i)+(7-2i)$

$4+5i+7-2i$

$11+3i$

ex4 $(6-3i)-(5-2i)$

$6-3i-5+2i$

$-1-i$

multiply: FOIL, $i^2=-1$

ex5 $(7+2i)(5-3i)$

$35-21i+10i-6i^2$

$= 35-11i+6$

$= 41-11i$

$i^2=-1$

ex6 $(3i)(6-5i)+10i$

$18i-15i^2+10i$

$= 28i+15$

divide: multiply by complex conjugate ex. $4-3i$ & $4+3i$

ex7 $\frac{2-i}{3+2i}\left(\frac{3-2i}{3-2i}\right) = \frac{6-4i-3i+2i^2}{9-6i+6i-4i^2} = \frac{4-7i}{13}$

$+2$

$+4$

quadratic formula

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

* remember to reduce

discriminant

* tells your how many roots

$D>0$ positive → 2 real roots
$D=0$ → 1 real root
$D<0$ negative → no real roots

Complete the square

$a = 1$: both blanks are the same

ex 8 write in VF: $y = x^2 - 12x + 5$

$y = (x^2 - 12x + __) - __ + 5$

$(b/2)^2$

$y = (x^2 - 12x + 36) - 36 + 5$

$$\boxed{y = (x-6)^2 - 31}$$

$$\boxed{V: (6, -31)}$$

ex 9 solve $x^2 + 6x - 1 = 0$

$(x^2 + 6x + 9) - 9 - 1 = 0$

$(x+3)^2 - 10 = 0$

$(x+3)^2 = 10$

$x + 3 = \pm\sqrt{10}$

$$\boxed{x = -3 \pm \sqrt{10}}$$

$a \neq 1$

ex 10 write in VF: $y = -2x^2 - 12x + 3$

$y = -2(x^2 + 6x + __) - __ + 3$

$(b/2)^2$ $\quad a \cdot (b/2)^2$

$y = -2(x^2 + 6x + 9) - -18 + 3$

$y = -2(x+3)^2 + 18 + 3$

$$\boxed{y = -2(x+3)^2 + 21}$$

$$\boxed{V: (-3, 21)}$$

ex 11 solve $3x^2 + 12x - 6 = 0$

$3(x^2 + 4x + 4) - 12 - 6 = 0$

$3(x+2)^2 - 18 = 0$

$3(x+2)^2 = 18$

$(x+2)^2 = 6$

$x + 2 = \pm\sqrt{6}$

$$\boxed{x = -2 \pm \sqrt{6}}$$