Name Schlansky Date

Algebra II CC – Midterm Review HW #2 Period

1. What is the solution set of $\sqrt{34-x} = x-4$?

(1) $\{-2,9\}$ (3) $\{9\}$

(2) $\{-2\}$ (4) $\{-9,2\}$

MC Strategy $(\sqrt{34-x})^2 = (x-4)^2$ Square binomial theorem

$34-x = x^2-8x+16$

$-34+x \quad +x \quad -34$

$0 = x^2-7x-18$

$0 = (x-9)(x+2)$

$x-9=0 \quad x+2=0$

$+9 \quad +9 \quad -2 \quad -2$

$x=9 \quad x=-2$

check ✓ check ✗

2. The solutions of the equation $x^2-4x+20=0$ are

(1) $2\pm 4i$ (3) $4\pm 8i$

(2) $-2\pm 4i$ (4) $-4\pm 8i$

completing the square & quadratic formula

$\left(\frac{-4}{2}\right)^2 = 4$

$x^2-4x+20=0$

$-20 \quad -20$

$x^2-4x = -20$

$x^2-4x+\boxed{4} = -20+\boxed{4}$

$(x-2)(x-2) = -16$

$\sqrt{(x-2)^2} = \sqrt{-16}$

$x-2 = \pm 4i$

$+2 \quad +2$

$x = 2\pm 4i$

3. When simplified, the fraction $\dfrac{\frac{1}{x}-\frac{1}{y}}{\frac{y}{x}-\frac{x}{y}}$ is equivalent to

multiply by LCD xy $\left(\frac{1}{x}-\frac{1}{y}\right)xy$ $\left(\frac{y}{x}-\frac{x}{y}\right)xy$

MC Strategy

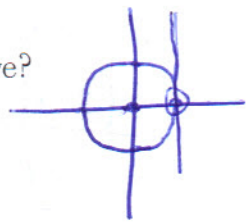
$\frac{y-x}{y^2-x^2} \quad \frac{y-x}{(y+x)(y-x)} = \frac{1}{y+x}$

(1) $\dfrac{1}{x+y}$ (3) $-\dfrac{1}{x+y}$

(2) $\dfrac{1}{x-y}$ (4) $-\dfrac{1}{x-y}$

4. How many solutions does the system whose equations are $x^2+y^2=4$ and $x=-2$ have?

circle line



use graph paper

$(0,0), r=2$

(1) one (3) three

(2) two (4) zero

5. Perform the indicated operation and express in simplest form:

Keep, Change, Flip

Factor!

$\dfrac{x^2-5x-14}{3x^3-2x^2-12x+8} \div \dfrac{6+9x}{4-9x^2}$

$\frac{x^2-5x-14}{3x^3-2x^2-12x+8} \cdot \frac{4-9x^2}{6+9x}$

$\frac{(x-7)(x+2)}{(x+2)(x-2)(3x-1)} \cdot \frac{(2+3x)(2-3x)}{3(2+3x)}(-1)$

$\frac{-1(x-7)}{3(x-2)}$

$\frac{3x^3}{x^2} \quad \frac{-2x^2}{x^2} \quad \frac{-12x}{4} \quad \frac{+8}{4}$

$x^2(3x-2) - 4(3x-2)$

$(x^2-4)(3x-2)$

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

Factor denominators
multiply by LCD

6. Solve for x: $\frac{x+1}{x+2} - \frac{2}{x} = \frac{-4}{x^2+2x}$

$x(x+2)\left(\frac{x+1}{x+2}\right) - x(x+2)\left(\frac{2}{x}\right) = x(x+2)\left(\frac{-4}{x(x+2)}\right)$

$x(x+1) - 2(x+2) = -4$

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

$x^2 - x - 4 = -4$

$+4 \quad +4$

$x^2 - x = 0$

$x(x-1) = 0$

$x = 0$ check ✗

$x - 1 = 0$

$+1 \quad +1$

$x = 1$ check ✓

7. Express $(3i)^2(-2i)(x-8i)$ in simplest $a+bi$ form.

$(9i^2)(-2i)(x-8i)$

$(9(-1))(-2i)(x-8i)$

$(-9)(-2i)(x-8i)$

$18i(x-8i)$

$18xi - 144i^2$

$18xi - 144(-1)$

$18xi + 144$

$144 + 18xi$

8. Solve the system of equations algebraically for x and y:

$y = 2x^2 + 2x + 3$

$y = x + 3$

$2x^2 + 2x + 3 = x + 3$

$-x - 3 \quad -x - 3$

$2x^2 + x = 0$

$x(2x+1) = 0$

$x = 0$ | $2x + 1 = 0$

$-1 \quad -1$

$\frac{2x}{2} = \frac{-1}{2}$

$x = \frac{-1}{2}$

$x = 0$ | $x = -\frac{1}{2}$

$y = 0 + 3$ | $y = -\frac{1}{2} + 3$

$y = 3$ | $y = 2.5$

$(0, 3)$ | $(-.5, 2.5)$

$y - 2x = 2x^2 + 3$

$+2x \quad +2x$

$x = y - 3$

$+3 \quad +3$

Isolate a variable (if possible, isolate y in both equations.)

Sub one equation into the other

* 9. Solve algebraically for x: $2x^3 - x^2 - 18x + 9 = 0$

$-9 \quad -9$

$x^2 \quad x^2$

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

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

$(x+3)(x-3)(2x-1) = 0$

$x + 3 = 0$ | $x - 3 = 0$ | $2x - 1 = 0$

$-3 \quad -3$ | $+3 \quad +3$ | $+1 \quad +1$

$x = -3$ | $x = 3$ | $\frac{2x}{2} = \frac{1}{2}$

$x = \frac{1}{2}$

Polynomial equations: Factor