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Date _____
Algebra II

Equations and Systems Review Sheet

Store each answer
Type in left hand side
Type in right hand side

1. The solution set of the equation $\sqrt{2x-4} = x-2$ is
1) $\{-2,-4\}$
2) $\{2,4\}$
3) $\{4\}$
4) $\{\ \}$

2. What is the solution set of the equation $\frac{30}{x^2-9} + 1 = \frac{5}{x-3}$?
1) $\{2,3\}$
2) $\{2\}$
3) $\{3\}$
4) $\{\ \}$

3. The solutions to the equation $3x^2 - 4x + 2 = 2x - 3$ are
1) $\frac{2}{3} \pm \frac{\sqrt{2}}{3}i$
2) $1 \pm \frac{\sqrt{6}}{3}i$
3) $1 \pm \frac{\sqrt{12}}{3}$
4) $1 \pm 2\sqrt{6}i$

$-2x+3 \quad -2x+3$
$3x^2 - 6x + 5 = 0$

PlySmlt2
1
$x = 1 \pm .816496580 9i$

PlySmlt2
1
$1 \pm .816496580 9i$

4. The roots of the equation $x^2 - 4x = -13$ are
1) $2 \pm 3i$
2) $2 \pm 6i$
3) $2 \pm \sqrt{17}$
4) $2 \pm \sqrt{13}$

$+13 \quad +13$
$x^2 - 4x + 13 = 0$

PlySmlt2
1
$x = 2 \pm 3i$

Store a value for X
Type in original problem
Type in each answer
Match them up

5. Given i is the imaginary unit, $(2-yi)^2$ in simplest form is
1) $y^2 - 4yi + 4$
2) $-y^2 - 4yi + 4$
3) $-y^2 + 4$
4) $y^2 + 4$

$-96 - 40i$
$-96 - 40i$

$-2400 - 300i$

6. The expression $6xi^3(-4xi + 5)$ is equivalent to
1) $2x - 5i$
2) $-24x^2 - 30xi$
3) $-24x^2 + 30x - i$
4) $26x - 24x^2i - 5i$

$-2400 - 300i$

Radical Equations

1) Isolate the radical
2) Square both sides
3) Solve equation
4) Check

Fractional Equations

1) Multiply by the LCD
2) Solve equation
3) Check

	x	+3
x	x^2	+3x
+3	+3x	+9

x^2+6x+9

	x	-2
x	x^2	-2x
-2	-2x	4

Solve the following equations algebraically

7. $3 = -x+\sqrt{x+5}$

$+x \quad +x$

$(x+3)^2 = (\sqrt{x+5})^2$

$(x+3)(x+3) = x+5$

$x^2+6x+9 = x+5$

$-x-5 \quad -x-5$

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

$(x+4)(x+1) = 0$

$x+4=0 \quad | \quad x+1=0$

$-4 \quad -4 \quad -1 \quad -1$

$x=-4$ reject $\quad x=-1$ ✓

8. $x = 2+\sqrt{x+4}$

$-2 \quad -2$

$(x-2)^2 = (\sqrt{x+4})^2$

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

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

$-x-4 \quad -x-4$

$x^2-5x = 0$

$x(x-5) = 0$

$x=0$ reject $\quad x-5=0$

$+5 \quad +5$

$x=5$ ✓

9. $\frac{x}{x-1} = \frac{2}{x} + \frac{1}{x-1}$ $\quad x(x-1)$

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

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

$x^2 = 3x-2$

$-3x+2 \quad -3x+2$

$x^2-3x+2 = 0$

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

$x-2=0 \quad | \quad x-1=0$

$+2 \quad +2 \quad +1 \quad +1$

$x=2$ ✓ $\quad x=1$ reject

10. $\frac{2}{x} - \frac{3x}{x+3} = \frac{x}{x+3}$ $\quad x(x+3)$

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

$2x+6 - 3x^2 = x^2$

$-2x-6 \quad +3x^2 \quad +3x^2-2x-6$

$\frac{0}{2} = \frac{4x^2-2x-6}{2}$

$0 = 2x^2-x-3$

x^2-x-6

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

$\frac{2}{2} \quad \frac{2}{2}$

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

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

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

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

$x = 3/2$ ✓

11. Solve for x and express your answer in simplest radical form: $x^2 - 6x = -12$

$+12 \quad +12$

$a=1$

$b=-6$

$c=12$

$x^2-6x+12 = 0$

$x = \frac{6 \pm \sqrt{(-6)^2-4(1)(12)}}{2(1)}$

$x = \frac{6 \pm \sqrt{-12}}{2}$

$x = \frac{6 \pm 2i\sqrt{3}}{2}$

$x = 3 \pm i\sqrt{3}$

$\sqrt{-12}$

$i\sqrt{12}$

$\sqrt{4}\sqrt{3}$

$2i\sqrt{3}$

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

12. Solve for x and express your answer in simplest $a+bi$ form: $4x^2 + 2x = -1$

$+1 \quad +1$

$4x^2+2x+1 = 0$

$a=4$

$b=2$

$c=1$

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

$x = \frac{-2 \pm \sqrt{-12}}{8}$

$x = \frac{-2 \pm 2i\sqrt{3}}{8}$

$x = -\frac{1}{4} \pm \frac{1}{4}i\sqrt{3}$

$i^2 = -1$

Solve the following in simplest *a+bi* or radical form

13. $x^4 - 6x^2 = 27$

$-27 \quad -27$

$x^4 - 6x^2 - 27 = 0$

$(x^2 - 9)(x^2 + 3) = 0$

$x^2 - 9 = 0 \quad | \quad x^2 + 3 = 0$

$+9 \quad +9 \quad | \quad -3 \quad -3$

$\sqrt{x^2} = \sqrt{9} \quad | \quad \sqrt{x^2} = \sqrt{-3}$

$x = \pm 3 \quad | \quad x = \pm i\sqrt{3}$

14. $x^4 + 6x^2 = 40$

$-40 \quad -40$

$x^4 + 6x^2 - 40 = 0$

$(x^2 + 10)(x^2 - 4) = 0$

$x^2 + 10 = 0 \quad | \quad x^2 - 4 = 0$

$-10 \quad -10 \quad | \quad +4 \quad +4$

$\sqrt{x^2} = \sqrt{-10} \quad | \quad \sqrt{x^2} = \sqrt{4}$

$x = \pm i\sqrt{10} \quad | \quad x = \pm 2$

Express the following in simplest *a+bi* form

15. $(3k - 2i)^2$

	$3k$	$-2i$
$3k$	$9k^2$	$-6ki$
$-2i$	$-6ki$	$4i^2$

$9k^2 - 12ki + 4i^2$

$9k^2 - 12ki + 4(-1)$

$9k^2 - 12ki - 4$

16. $(4x - 3yi)^2$

	$4x$	$-3yi$
$4x$	$16x^2$	$-12xyi$
$-3yi$	$-12xyi$	$9y^2i^2$

$16x^2 - 24xyi + 9y^2i^2$

$16x^2 - 24xyi + 9y^2(-1)$

$16x^2 - 24xyi - 9y^2$

17. $-2ai^{49} - 3bi^{27} + 3ai^{225}$

$\frac{49}{4} = 12.25 \quad \frac{27}{4} = 6.75 \quad \frac{225}{4} = 56.25$

$-2a(i) - 3b(-i) + 3a(i)$

$-2ai + 3bi + 3ai$

$1ai + 3bi$

18. $6ki^{28} + 4pi^{31} - 8pi^{73}$

$\frac{28}{4} = 7.0 \quad \frac{31}{4} = 7.75 \quad \frac{73}{4} = 18.25$

$6k(1) + 4p(-i) - 8p(i)$

$6k - 4pi - 8pi$

$6k - 12pi$

Spiral Review

To determine if $x - a$ **is a factor:**

Use remainder theorem and see if $p(a) = 0$. If the remainder is 0, it is a factor. If the remainder is not 0, it is not a factor.

19. Which binomial is *not* a factor of the expression $x^3 - 4x^2 - 25x + 28$?

1) $x+6$ $p(-6) = -182$
2) $x-7$ $p(7) = 0$
3) $x-1$ $p(1) = 0$
4) $x+4$ $p(-4) = 0$

20. Which binomial is a factor of the expression $x^4 + 4x^2 - 32$?

1) $x+8$ $p(-8) = 4320$
2) $x-8$ $p(8) = 4320$
3) $x-1$ $p(1) = -27$
4) $x+2$ $p(-2) = 0$