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CRMA 0372
College Readiness Algebra II
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Solve by factoring

1) $3x^2 = 3 - 8x$

$\boxed{ax^2+bx+c}$

$$\underbrace{3x^2 + 8x - 3}_{\text{Now factor}} = 0$$

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

$-x$

$+9x$

So either

$3x - 1 = 0$ or $x + 3 = 0$

$x = 1/3$ or $x = -3$

$\left\{\frac{1}{3}, -3\right\}$

$\left\{-3, \frac{1}{3}\right\}$

2) $6x^2 = -12x$

$6x^2 + 12x = 0$

$6x(x+2) = 0$

either

$\frac{\cancel{6}x}{\cancel{6}} = \frac{0}{6}$ or $(x+2) = 0$

$x = 0$; $x = -2$

$\{-2, 0\}$

1) Factoring
make $= 0$
then factor

2) Square root property
$u^2 = k$
$u = \pm\sqrt{k}$

3) Completing the square

4) Quadratic formula

3) Square root property

$\boxed{u^2=k}$ $(x-5)^2=10$

$\sqrt{(x-5)^2} = \pm\sqrt{10}$

$x-5 = \pm\sqrt{10}$

$x = 5 \pm \sqrt{10}$

$\{5+\sqrt{10}, 5-\sqrt{10}\}$

4) $x^2 = -36$

$\sqrt{x^2} = \pm\sqrt{-36}$, $\sqrt{-36} = \sqrt{-1}\sqrt{36}$

$x = \pm 6i$ $= 6i$

No real solutions

5) $\frac{6x^2}{6} = \frac{36}{6}$

$\boxed{u^2=k}$

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

$x = \pm\sqrt{6}$

Exact $\{-\sqrt{6}, \sqrt{6}\}$

6) Solve by completing the square

$x^2+6x+13=0$

$\underbrace{x^2+6x+\boxed{9}}_{\text{Make this into a perfect square trinomial \& then factor}} = -13+9$

Magic #

$\left(\frac{6}{2}\right)^2 = (3)^2 = 9$

$\sqrt{(x+3)^2} = \pm\sqrt{-4}$

$x+3 = \pm 2i$

$x = -3 \pm 2i$

$\{-3+2i, -3-2i\}$

Solve by completing the square

7) $\frac{2x^2}{2}+\frac{8x}{2}-\frac{42}{2}=\frac{0}{2}$

Magic #

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

$x^2+4x-21=0$

$x^2+4x+\boxed{4}=21+4$

$\sqrt{(x+2)^2}=\pm\sqrt{25}$

$x+2=\pm 5$

$x=-2\pm 5$

$x=-2+5$ or $x=-2-5$

$=3$ $\quad$ $=-7$

$\{-7, 3\}$

Quad formula

8) $2x^2-3x=5$

$ax^2+bx+c=0$

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

$2x^2-3x-5=0$

$a=2 \quad b=-3 \quad c=-5$

$x=\frac{-(-3)\pm\sqrt{9-4(-10)}}{2(2)}$

$=\frac{3\pm\sqrt{9+40}}{4}$

$=\frac{3\pm\sqrt{49}}{4}$

$=\frac{3\pm 7}{4}$

$x=\frac{10}{4}$ or $x=\frac{-4}{4}$

$=\frac{5}{2}$ $\quad$ $=-1$

$\left\{-1, \frac{5}{2}\right\}$

9) $-x(x+4)=12$

$ax^2+bx+c=0$

$-x^2-4x-12=0$

$x^2+4x+12=0$

$a=1 \quad b=4 \quad c=12$

$$x=\frac{-4\pm\sqrt{16-4(12)}}{2}$$

$$x=\frac{-4\pm\sqrt{-32}}{2}$$

$\sqrt{32}=\sqrt{16}\sqrt{2}$
$=4\sqrt{2}$

$$x=\frac{-4\pm i\sqrt{32}}{2}$$

$$x=\frac{-4\pm 4i\sqrt{2}}{2}$$

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

10a) $3x^2+x+3=0$

$a=3 \quad b=1 \quad c=3$

$(1)^2-4(9)$

$=1-36$

$=-35$ two imaginary solution

10b) $4x^2=6x-2$

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

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

$b^2-4ac \qquad a=2 \quad b=-3 \quad c=1$

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

$=9-8$

$=1$

two real rational solutions.

10c) $3x(x+1) = 9$

$$\frac{3x^2}{3} + \frac{3x}{3} - \frac{9}{3} = \frac{0}{3}$$

$x^2 + x - 3 = 0$

$a = 1 \quad b = 1 \quad c = -3$

$b^2 - 4ac$

$(1)^2 - 4(-3) = 1 + 12$

$= 13$

two irrational solutions.

#

$$\overset{2}{\cancel{6}}\left(\frac{2}{\cancel{3}}x^2\right) - \overset{2}{\cancel{6}}\left(\frac{2}{\cancel{3}}x\right) + \cancel{6}\left(\frac{1}{\cancel{6}}\right) = (0)(6)$$

LCD: 6

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

$a = 4 \quad b = -4 \quad c = 1$

$b^2 - 4ac$

$= (-4)^2 - 4(4)$

$= 16 - 16$

$= 0$

one rational solution

Review Assessment

1) $8m^2n^3 - 24m^2n^2 + 4m^2n$

$= 4m^2n(2n^2 - 6n + 1)$

2) $42x^3y^2 + 14xy^2 - 21x^4y^4$

$= 7xy^2(6x^2 + 2 - 3x^3y^2)$

4) $5x^3(x-2) - 15x^2(x-2)^2$

$= 5x^2(x-2)[x - 3(x-2)]$

$= 5x^2(x-2)(x - 3x + 6)$

$= 5x^2(x-2)(-2x+6)$

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

9) $22x + x^2 + 72$

$= x^2 + 22x + 72$

$= (x+4)(x+18)$

72
1, 72
2, 36
3, 24
4, 18

12) $-10 + 10x^2 + 21x$

$= 10x^2 + 21x - 10$

$= (2x + 5)(5x - 2)$

$+25x$

$-4x$

A	C	B
10	-10	21
2	-2	-4
5	5	25

$(2x+5)(5x-2)$

16) $25p^2q^2 - 4$

$= (5pq + 2)(5pq - 2)$

35)

$f(x) = a(x-h)^2 + k$

$f(x) = -2x^2 + 12x - 16$

$f(x) = -2(x^2 - 6x + \boxed{9}) - 16 + 18$

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

vertex $(3,2)$

axis of symmetry $x=3$

maximum $y=2$