November 10, 2015

#19) $6y^2 + 6 = 13y$

$6y^2 - 13y + 6 = 0$ $\quad a = 6,\ b = -13,\ c = 6$

$$x = \frac{-(-13) \pm \sqrt{(-13)^2 - 4(6)(6)}}{2(6)}$$

$$= \frac{13 \pm \sqrt{169 - 24(6)}}{12}$$

$$= \frac{13 \pm \sqrt{169 - 144}}{12}$$

$$= \frac{13 \pm \sqrt{25}}{12}$$

Perfect Square Root * That $6y^2 - 13y + 6$ is factorable!

$$= \frac{13 \pm 5}{12}$$

① $x = \frac{13+5}{12} = \frac{18}{12} = \frac{3}{2}$

② $x = \frac{13-5}{12} = \frac{8}{12} = \frac{2}{3}$

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$6y^2 - 13y + 6$

$ac = 36$, $b = -13$

$-9, -4$

$6y^2 - 9y - 4y + 6$

$3y(2y-3) - 2(2y-3)$

$(2y-3)(3y-2) = 0$

① $2y - 3 = 0$

$2y = 3$

$y = 3/2$

② $3y - 2 = 0$

$3y = 2$

$y = 2/3$

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$x^4 - 25x^2 + 144 = 0$

in $ax^2 + bx + c = 0$ form

Method

Let $u = x^2$

$(x^2)^2 - 25x^2 + 144 = 0$

$u^2 - 25u + 144 = 0$

$$u = \frac{-(-25) \pm \sqrt{(-25)^2 - 4(1)(144)}}{2(1)}$$

$$= \frac{25 \pm \sqrt{625 - 576}}{2}$$

$$= \frac{25 \pm \sqrt{49}}{2}$$

meaning factorable

$$= \frac{25 \pm 7}{2}$$

① $u = \frac{25+7}{2} = \frac{32}{2} = 16$

② $u = \frac{25-7}{2} = \frac{18}{2} = 9$

① $u = x^2 = (16)^2 = 256$

② $u = x^2 = (9)^2 = 81$

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10.5

Quadratic Functions

$f(x) = x^2$

x	$f(x)$
0	0
1	1
2	4
-1	1
-2	4

Parabolic Curve

lowest point

$x = 0$ Axis of Symmetry

Vertex of the parbola

$ax^2 + bx + c$ Standard Form

$(x-h)^2 + k$ Vertex form

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Graph

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

Convert to Vertex Form $(x-h)^2 + k$

* By completing the Square * But not solving

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

a) $-5 \cdot \frac{1}{2} = -\frac{5}{2}$

b) $\left(-\frac{5}{2}\right)^2 = \frac{25}{4}$

$x^2 - 5x + \frac{25}{4} = -\frac{2}{1} + \frac{25}{4}$

$\left(x - \frac{5}{2}\right)^2 = \frac{-8+25}{4} = \frac{17}{4}$

$\left(x - \frac{5}{2}\right)^2 = \frac{17}{4}$ * Do not solve! Write in Vertex form

$\left(x - \frac{5}{2}\right)^2 - \frac{17}{4} = 0$

$f(x) = \left(x - \frac{5}{2}\right)^2 - \frac{17}{4}$

h $\quad k$

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