

Tuesday: College of the week

Name of the college: _____

KSU

What is the yearly tuition?

What are the requirements to be accepted?

ACT:

SAT:

GPA:

What majors do they offer?

What are the average class sizes?

Male to Female ratio?

Answers to Completing the Square

- 1) 1; $(x-1)^2$ 2) $\frac{225}{4}$; $\left(x+\frac{15}{2}\right)^2$ 3) 4; $(x+2)^2$ 4) 16; $(x-4)^2$
 5) 225; $(y+15)^2$ 6) $\frac{1089}{196}$; $\left(p+\frac{33}{14}\right)^2$ 7) $\frac{169}{324}$; $\left(z-\frac{13}{18}\right)^2$ 8) 400; $(a+20)^2$
 9) $\frac{169}{4}$; $\left(r-\frac{13}{2}\right)^2$ 10) $\frac{361}{4}$; $\left(m+\frac{19}{2}\right)^2$ 11) $\{18, 2\}$
 12) $\{-5+2\sqrt{21}, -5-2\sqrt{21}\}$ 13) $\{-6+\sqrt{97}, -6-\sqrt{97}\}$ 14) $\{11, -1\}$
 15) $\{-8+\sqrt{73}, -8-\sqrt{73}\}$ 16) $\{20, -2\}$ 17) $\{3+\sqrt{103}, 3-\sqrt{103}\}$

$$\textcircled{2} \quad x^2 + 15x + \underline{56.25}$$

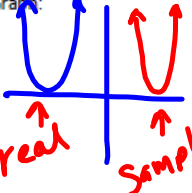
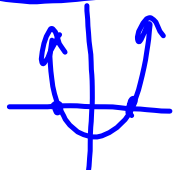
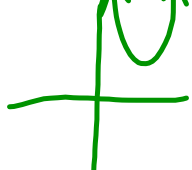
$$\frac{15}{2} = 7.5 \quad (x+7.5)^2$$

$$(7.5)^2$$

$$\textcircled{12} \quad -5 \pm \sqrt{84}$$

$$-5 \pm 2\sqrt{21}$$

$\begin{array}{c} \textcircled{2} \quad 42 \\ \swarrow \quad \searrow \\ 2 \quad 21 \end{array}$

<p>Quadratic Formula</p>	$ax^2 + bx + c = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	<p>Discriminant: $a = 1$ $b = 10$ $c = 25$ $(10)^2 - 4(1)(25)$</p>	<p>Example: $x^2 + 10x + 25 = 0$ Solution(s): $x = \frac{-10 \pm \sqrt{0}}{2(1)}$ $x = \frac{-10}{2}$ $x = -5$</p>
<p>How and why does the discriminant work?</p>	$b^2 - 4ac$ $a > 0$ 2 real sol. $a = 0$ 1 Real Sol. $a < 0$ 2 imag. solut.	<p>Means: 0 1 Real Solution</p>	<p>Graph: </p>
<p>Example: Discriminant: $a = 6$ $b = 1$ $c = 15$ $(1)^2 - 4(6)(15)$</p>	<p>Example: $6x^2 + x - 15 = 0$ Solution(s): $x = \frac{-1 \pm \sqrt{361}}{2(6)}$ $x = \frac{-1 + 19}{12}$ $x = \frac{18}{12}$ $x = \frac{-1 - 19}{12}$ $x = \frac{-20}{12}$ $x = \frac{3}{3}$ $x = \frac{-5}{3}$</p>	<p>Discriminant: $a = 1$ $b = 2$ $c = 5$ $(2)^2 - 4(1)(5)$</p>	<p>Example: $x^2 + 2x + 5 = 0$ Solution(s): $x = \frac{-2 \pm \sqrt{-16}}{2(1)}$ $x = \frac{-2 \pm 4i}{2}$ $x = -1 \pm 2i$</p>
<p>Means: 361 2 real Solution</p>	<p>Graph: </p>	<p>Means: -16 2 imaginary Sol.</p>	<p>Graph: </p>

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

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

$$\sqrt{-\#}$$

$$\sqrt{-16}$$

$$i\sqrt{16}$$

$$i(4) = 4i$$

The Quadratic Formula

When written in standard form: $ax^2 + bx + c = 0$, you can find x by using...

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

- ⇒ Write quadratic equation in standard form
- ⇒ Identify $a, b,$ and c
- ⇒ Plug values into the quadratic formula

Solve. $x^2 - 5x - 4 = 0$

$a = 1$
 $b = -5$
 $c = -4$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(-4)}}{2(1)}$$

$$x = \frac{5 \pm \sqrt{41}}{2}$$

Find the roots. $x^2 - 6x = -10$

$$x^2 - 6x + 10 = 0$$

$a = 1$
 $b = -6$
 $c = 10$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(10)}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-4}}{2}$$

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

Find the zeros. $4x^2 + 10x = -10x - 25$

$$4x^2 + 20x + 25 = 0$$

$a = 4$
 $b = 20$
 $c = 25$

$$x = \frac{-(20) \pm \sqrt{(20)^2 - 4(4)(25)}}{2(4)}$$

$$x = \frac{-20 \pm \sqrt{0}}{8}$$

$$x = -\frac{20}{8} \quad \boxed{x = -\frac{5}{2}}$$

Solve. $x^2 - 4x + 5 = 0$

$a = 1$
 $b = -4$
 $c = 5$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(5)}}{2(1)}$$

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

$$\frac{4 \pm 2i}{2} \quad \boxed{x = 2 \pm i}$$