Kuta Software - Infinite Algebra 1

Name Key.

Date _____ Period ____

Factoring Trinomials (a > 1)

Factor each completely.

1) $3p^2 - 2p - 5$

$(3p - 5)(p + 1)$ ✓

$-5p + 3p = -2p$ ✓

2) $2n^2 + 3n - 9$

$(2n - 3)(n + 3)$

$-3n$

$6n$

$= 3n$ ✓

3) $3n^2 - 8n + 4$

$(3n - 2)(n - 2)$

$-2n$

$-6n$

$= -8n$ ✓

4) $5n^2 + 19n + 12$

$(5n + 4)(n + 3)$

$4n$

$15n$

$= 19n$ ✓

5) $2v^2 + 11v + 5$

$(2v + 1)(v + 5)$

$1v$

$10v$

$= 11v$ ✓

6) $2n^2 + 5n + 2$

$(2n + 1)(n + 2)$

$1n$

$4n$

$= 5n$ ✓

7) $7a^2 + 53a + 28$

$(7a + 4)(a + 7)$

$4a$

$49a$

$= 53a$

8) $9k^2 + 66k + 21$

$3(3k^2 + 22k + 7)$

$3(3k + 1)(k + 7)$

$1k$

$21k$

$= 22k$

9) $15n^2 - 27n - 6$

$3(5n^2 - 9n - 2)$

$3(5n + 1)(n - 2)$

$+1n$

$-10n = -9n$ ✓

10) $5x^2 - 18x + 9$

$(5x - 3)(x - 3)$

$-3x$

$-15x$

$= -18x$ ✓

11) $4n^2 - 15n - 25$

$(4n + 5)(n - 5)$

$+5n$

$-20n$

$= -15n$ ✓

12) $4x^2 - 35x + 49$

$(4x - 7)(x - 7)$

$-7x$

$-28x$

$-35x$ ✓

13) $4n^2 - 17n + 4$

$(4n - 1)(n - 4)$

$-1n$

$-16n$

$-17n$ ✓

14) $6x^2 + 7x - 49$

$(2x + 7)(3x - 7)$

$21x$

$-14x$

$7x$ ✓

15) $6x^2 + 37x + 6$

$(6x + 1)(1x + 6)$

$1x$

$36x$

$37x$ ✓

16) $-6a^2 - 25a - 25$

$-1(6a^2 + 25a + 25)$

$-1(2a + 5)(3a + 5)$

$(15a)$

$10a$

$25a$ ✓

17) $6n^2 + 5n - 6$

$(3n - 2)(2n + 3)$

$-4n$

$9n$

$5n$ ✓

18) $16b^2 + 60b - 100$

$4(4b^2 + 15b - 25)$

$4(b + 5)(4b - 5)$

$20b$

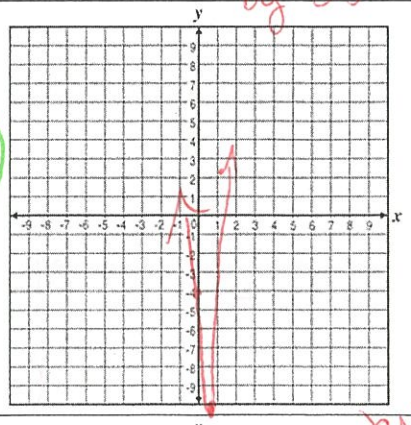
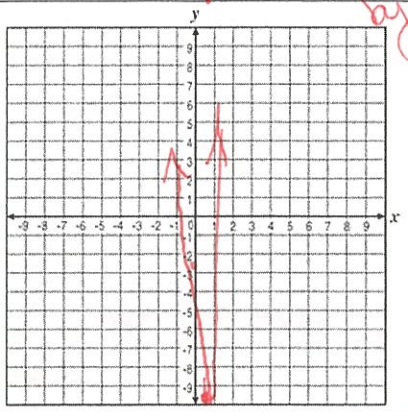
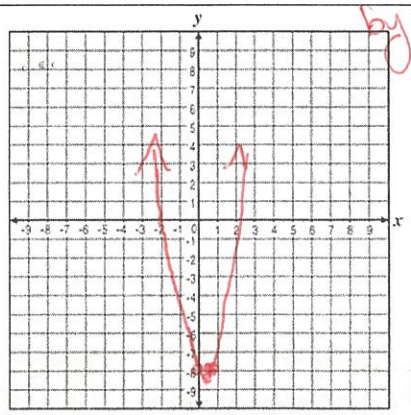
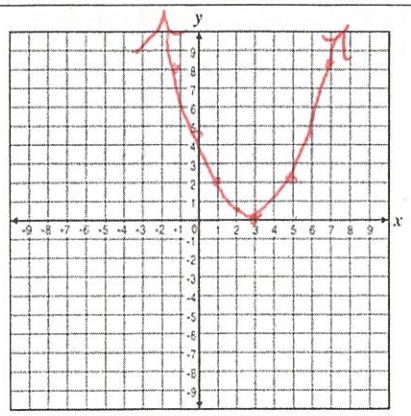
$-5b$

$15b$

Standard Form, Factored Form, Vertex Form

1. How are quadratic's factored form, *x*-intercepts, vertex, and vertex form related? Fill in the missing entries in the table below:

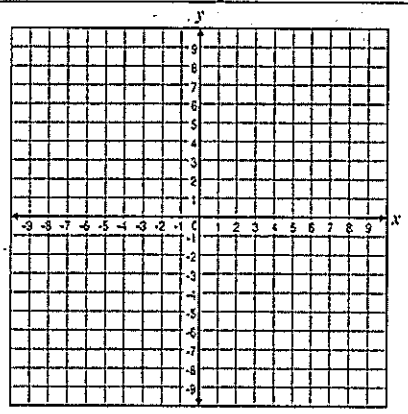
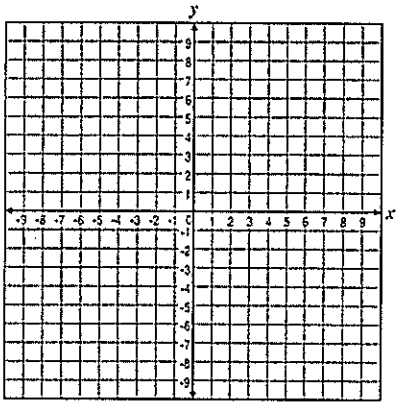
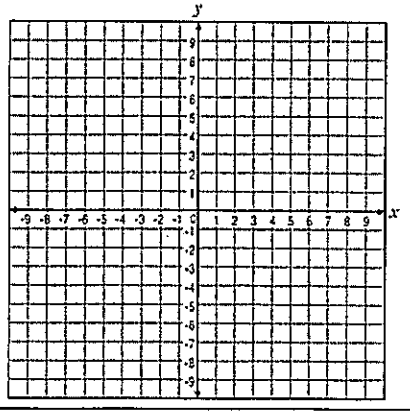
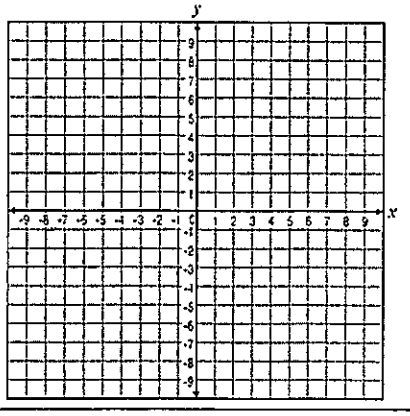
Standard Form	Factored Form	Vertex Form	Sketch Graph
$y = 2x^2 + 8x - 10$ $\frac{}{2}$	$2(x^2+4x-5)$ $2(x+5)(x-1)$	$2(x^2+4x+4)-10$ $\left(\frac{4}{2}\right)^2$ $-2(4)$ $y=2(x+2)^2-18$	by 2's
$y = -2x^2 + 7x + 15$ $y=-2(x^2-3.5x)+15$ $\left(\frac{-3.5}{2}\right)^2 = 3.0625$	$y=-1(2x^2-7x-15)$ $y=-1(2x+3)(x-5)$	$=-2(x^2-3.5x+3.0625)+15$ $+2(3.0625)$ $y=-2(x-1.75)^2+$ [illegible] 21.25	by 2's
$y=$ $-3x^2+6x+9$	$y=-3(x^2-2x-3)$ $-3(x-3)(x+1)$	$y = -3(x-1)^2 + 12$ $-3(x^2-2x+1)+12$	by 2's
$y=2x^2+x-21$ $y=2\left(x^2+\frac{1}{2}x+\frac{1}{16}\right)-21$ $\left(\frac{1}{2}\cdot\frac{1}{2}\right)^2$	$y = (x-3)(2x+7)$ $y=2x^2-6x+7x-21$ $-2\left(\frac{1}{16}\right)$	$y=2\left(x+\frac{1}{4}\right)^2-21-\frac{1}{8}$ $y=2\left(x+\frac{1}{4}\right)^2-\frac{169}{8}$	

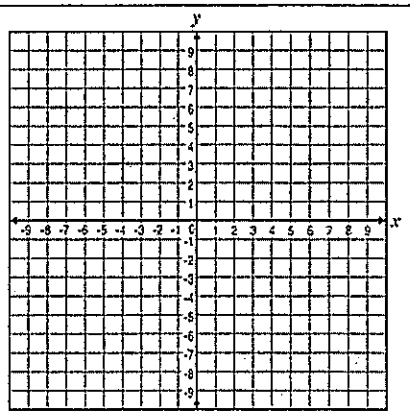
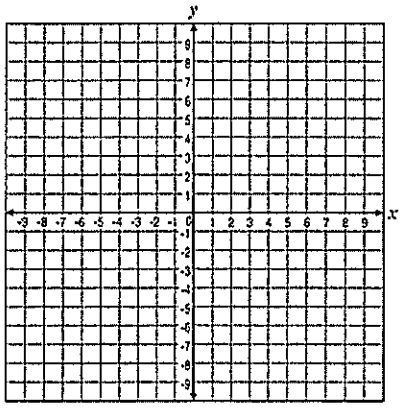
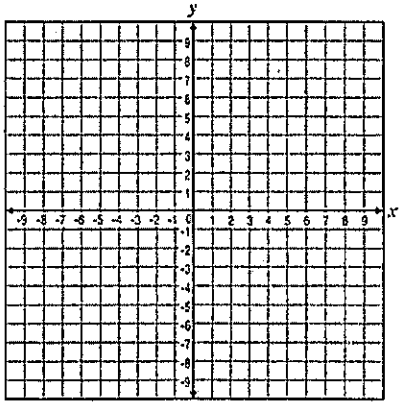
$y = 3x^2 - 16x - 12$ $y = 3(x^2 - \frac{16}{3}x \quad) - 12$ $(\frac{1}{2} \cdot \frac{16}{3})^2$	$y = (3x + 2)(x - 6)$	$y = 3(x^2 - \frac{16}{3}x + \frac{256}{36}) - 12$ $-3(\frac{256}{36})$ $y = 3(x - \frac{16}{6})^2 - \frac{400}{12}$ $y = 3(x - \frac{8}{3})^2 - \frac{100}{3}$	by 3's 
$y = 12x^2 - 37x - 10$ $y = 12(x^2 - \frac{37}{12}x \quad) - 10$ $(\frac{1}{2}(\frac{-37}{12}))^2$	$y = (4x + 1)(3x - 10)$	$= 12(x^2 - \frac{37}{12}x + \frac{1369}{576}) - 10$ $-12(\frac{1369}{576})$ $y = 12(x - \frac{37}{24})^2 - \frac{1849}{48}$	by 4's 
$y = 3x^2 - 2x - 16$ $3(x^2 - \frac{2}{3}x + \frac{1}{9}) - 16$ $-3(\frac{1}{9})$ $(\frac{1}{2} \cdot \frac{2}{3})^2$	$(3x - 8)(x + 2)$	$3(x - \frac{1}{3})^2 - \frac{49}{3}$	by 2's 
$\frac{1}{2}(x^2 - 6x + 9)$ $y = \frac{1}{2}x^2 - 3x + \frac{9}{2}$	$y = \frac{1}{2}(x - 3)^2$ same	$y = \frac{1}{2}(x - 3)^2$	

Standard Form, Factored Form, Vertex Form

Key

1. How are quadratic's factored form, *x*-intercepts, vertex, and vertex form related? Fill in the missing entries in the table below:

Standard Form	Factored Form	Vertex Form	Graph
$y = 2x^2 + 8x - 10$ $y = 2(x^2+4x-5)$	$2(x+5)(x-1)$	$2(x^2+4x+4-5-4)$ $2(x+2)^2-18$	
$y = -2x^2 + 7x + 15$	$(-2x-3)(x-5)$	$-2x^2+7x+15$ $-2\left(x^2+\frac{7}{2}x+\frac{49}{16}-\frac{49}{16}\right)+15$ $-2\left(x-\frac{7}{4}\right)^2+\frac{49}{8}+15$ $-2\left(x-\frac{7}{4}\right)^2+\frac{169}{8}$	
$-3(x-1)^2+12$ $-3(x^2-2x+1)+12$ $-3x^2+6x-3+12$ $-3x^2+6x+9$	$-3(x^2-2x-3)$ $-3(x-3)(x+1)$	$y = -3(x-1)^2+12$	
$(x-3)(2x+7)$ $2x^2+7x-6x-21$ $2x^2+x-21$	$y = (x-3)(2x+7)$	$2x^2+x-21$ $2\left(x^2+\frac{1}{2}x+\frac{1}{16}-\frac{1}{16}\right)-21$ $2\left(x+\frac{1}{4}\right)^2-\frac{1}{8}-21$ $2\left(x+\frac{1}{4}\right)^2-\frac{169}{8}$	

$(3x+2)(x-6)$ $3x^2-18x+2x-12$ $3x^2-16x-12$	$y=(3x+2)(x-6)$	$3x^2-16x-12$ $3\left(x^2-\frac{16}{3}x+\frac{256}{36}\right)-12$ ($-\frac{256}{36}$) $3\left(x-\frac{16}{6}\right)^2-\frac{256}{12}-12$ $3\left(x-\frac{16}{6}\right)^2-\frac{400}{12}$	
$y=12x^2-37x-10$	$(3x-10)(4x+1)$	$12x^2-37x-10$ $12\left(x^2-\frac{37}{12}x+\frac{1369}{144}-\frac{1369}{144}\right)-10$ $12\left(x-\frac{37}{24}\right)^2-\frac{1369}{12}-10$ $12\left(x-\frac{37}{24}\right)^2-\frac{1489}{12}$	
$y=3x^2-2x-16$	$(3x\ \ )(x\ \ )$ -16 $+1$ $+1$ -16 $+16$ -1 -1 $+16$ $+8$ -2 $(3x-8)(x+2)$	$3x^2-2x-16$ $3\left(x^2-\frac{2}{3}x+\frac{4}{36}-\frac{4}{36}\right)-16$ $3\left(x-\frac{2}{6}\right)^2-\frac{4}{12}-16$ $3\left(x-\frac{1}{3}\right)^2-\frac{49}{3}$	
$\frac{1}{2}(x-3)(x-3)$	$y=\frac{1}{2}(x-3)^2$	yah! $a=\frac{1}{2}$ $h=3$ $k=0$