$a(x^2+bx+\underline{\quad(b/2)^2\quad}) \neq a\cdot(b/2)^2$ ✓

Algebra 2 Name answers ID: 1

Assignment Date_____ Period____

Find the value that completes the square and then rewrite as a perfect square.

1) $x^2-\frac{67}{19}x+\_\_ = (x-67/38)^2$

↖ $b=-67/19$ $(b/2)^2=\frac{4489}{1444}$

2) $m^2+26m+\underline{169} = (m+13)^2$

$(26/2)^2=169$

3) $m^2-42m+\underline{441} = (m-21)^2$

$(-42/2)^2=441$

Put each equation into Vertex Form by completing the square.

4) $v^2-10v-10=0$

$(v^2-10v+25)-25-10=0$

$\boxed{(v-5)^2-35=0}$

5) $p^2-18p+30=0$

$(p^2-18p+81)-81+30=0$

$\boxed{(p-9)^2-51=0}$

6) $9b^2-18b-27=0$

$9(b^2-2b+1)-9-27=0$

$\boxed{9(b-1)^2-36=0}$

7) $3x^2-12x-26=0$

$3(x^2-4x+4)-12-26=0$

$\boxed{3(x-2)^2-38=0}$

Solve each equation by completing the square.

8) $k^2-2k-100=0$

$(k^2-2k+1)-1-100=0$

$(k-1)^2-101=0$ → $(k-1)^2=101$

$k-1=\pm\sqrt{101}$

$\boxed{k=\pm\sqrt{101}+1}$

9) $a^2-10a+85=0$

$(a^2-10a+25)-25+85=0$

$(a-5)^2+60=0$ → $(a-5)^2=-60$

$a-5=\pm 2i\sqrt{15}$

$\boxed{a=5\pm 2i\sqrt{15}}$

10) $k^2-10k+59=0$

$(k^2-10k+25)-25+59=0$

$(k-5)^2+34=0$ → $(k-5)^2=-34$

$k-5=\pm i\sqrt{34}$

$\boxed{k=5\pm i\sqrt{34}}$

11) $a^2-2a+78=0$

see back

12) $n^2-6n-72=0$

$(n^2-6n+9)-9-72=0$

$(n-3)^2-81=0$ → $(n-3)^2=81$

$n-3=\pm 9$

$\boxed{n=12,-6}$

13) $n^2+8n+92=10n$ → $n^2-2n+92$

$(n^2-2n+1)-1+92$

$(n-1)^2+91=0$ → $(n-1)^2=-91$

$n-1=\pm i\sqrt{91}$

$\boxed{n=1\pm i\sqrt{91}}$

14) $-b^2+22b+131=-2b^2-11$

see back

15) $v^2+18v-81=6v$

see back

16) $n^2+63=14n$ → $n^2-14n+63=0$

$(n^2-14n+49)-49+63=0$

$(n-7)^2+14=0$ → $(n-7)^2=-14$

$n-7=\pm i\sqrt{14}$

$\boxed{n=7\pm i\sqrt{14}}$

17) $4b=-59-b^2$ → $b^2+4b+59=0$

$(b^2+4b+4)-4+59=0$

$(b+2)^2+55=0$ → $(b+2)^2=-55$

$b+2=\pm i\sqrt{55}$

$\boxed{b=-2\pm i\sqrt{55}}$

18) $9a^2-28a=8a^2-95-10a$

see back

19) $18p^2-16p=-56+10p^2$

see back

→

11. $a^2 - 2a + 78 = 0$

$(a^2 - 2a + 1) - 1 + 78 = 0$

$(a-1)^2 + 77 = 0$

$(a-1)^2 = -77$

$a - 1 = \pm i\sqrt{77}$

$\boxed{a = 1 \pm i\sqrt{77}}$

14. $b^2 + 22b + 142 = 0$

$(b^2 + 22b + 121) - 121 + 142 = 0$

$(b+11)^2 + 21 = 0$

$(b+11)^2 = -21$

$b + 11 = \pm i\sqrt{21}$

$\boxed{b = -11 \pm i\sqrt{21}}$

15. $v^2 + 12v - 81 = 0$

$(v^2 + 12v + 36) - 36 - 81 = 0$

$(v+6)^2 - 117 = 0$

$(v+6)^2 = 117$

$v + 6 = \pm\sqrt{117}$

$\boxed{v = -6 \pm \sqrt{117}}$

18. $a^2 - 18a + 95 = 0$

$(a^2 - 18a + 81) - 81 + 95 = 0$

$(a-9)^2 + 14 = 0$

$(a-9)^2 = -14$

$a - 9 = \pm i\sqrt{14}$

$\boxed{a = 9 \pm i\sqrt{14}}$

19. $8p^2 - 16p + 56 = 0$

$8(p^2 - 2p + 1) - 8 + 56 = 0$

$8(p-1)^2 + 48 = 0$

$8(p-1)^2 = -48$

$(p-1)^2 = -6$

$p - 1 = \pm i\sqrt{6}$

$\boxed{p = 1 \pm i\sqrt{6}}$