Kuta $a > 1$

① $3p^2 - 2p - 5$ $\quad AC = -15p^2$ Subtract

1 15

3 5

$3p^2 - 5p + 3p - 5 = 0$

$p(3p-5) + 1(3p-5) = 0$

$(3p-5)(p+1) = 0$

$3p^2 + 3p - 5p - 5 = 0$

$3p(p+1) - 5(p+1) = 0$

$(p+1)(3p-5) = 0$

Solutions $3p - 5 = 0$ $\quad p + 1 = 0$

$3p = 5$ $\quad p = -1$

$p = \frac{5}{3}$

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

$AC = -18n^2$

18

1, 18

2, 9

3, 6

$2n^2 - 3n + 6n - 9 = 0$

$n(2n-3) + 3(2n-3) = 0$

$(2n-3)(n+3) = 0$

$2n^2 + 6n - 3n - 9 = 0$

$2n(n+3) - 3(n+3) = 0$

$(n+3)(2n-3) = 0$

solutions

$n+3 = 0$

$n = -3$

$2n - 3 = 0$

$2n = 3$

$n = \frac{3}{2}$

(3) $3n^2 - 8n + 4 = 0$

$AC = 12n^2$ Add

1, 12

2, 6

3, 4

$3n^2 - 3n - 4n + 4 = 0$

$3n(n-1) - 4(n-1) = 0$

$(n-1)(3n-4) = 0$

$3n^2 - 4n - 3n + 4 = 0$

$n(3n-4) - 1(3n-4) = 0$

$(3n-4)(n-1) = 0$

Solutions

$3n - 4 = 0$ $\quad$ $n - 1 = 0$

$3n = 4$ $\quad$ $n = 1$

$n = \frac{4}{3}$

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

AC

$60n^2$

60

1, 60

2, 30

3, 20

4, 15

5, 12

6, 10

A+C

$5n^2+15n+4n+12=0$

$5n(n+3)+4(n+3)=0$

$(n+3)(5n+4)=0$

$5n^2+4n+15n+12=0$

$n(5n+4)+3(5n+4)=0$

$(5n+4)(n+3)=0$

Solutions

$5n+4=0$

$5n=-4$

$n=-\frac{4}{5}$

$n+3=0$

$n=-3$

(5) $2v^2+11v+5=0$

$10v^2$ Add

$2v^2+10v+1v+5=0$

1, 10

2, 5

$2v(v+5)+1(v+5)=0$

$(v+5)(2v+1)=0$

$2v^2+1v+10v+5$

$v(2v+1)+5(2v+1)=0$

$(2v+1)(v+5)=0$

Solutions

$2v+1=0$

$2v=-1$

$v=\frac{-1}{2}$

$v+5=0$

$v=-5$

6 $2n^2+5n+2=0$

$AC=4n^2$

Add

4

1, 4

2, 2

$2n^2+1n+4n+2=0$

$n(2n+1)+2(2n+1)=0$

$(2n+1)(n+2)=0$

$2n^2+4n+1n+2=0$

$2n(n+2)+1(n+2)=0$

$(n+2)(2n+1)=0$

$n+2=0$ $\quad$ $2n+1=0$

$n=-2$ $\quad$ $2n=-1$

$n=\frac{-1}{2}$

7 $7a^2+53a+28=0$

$AC=(7a^2)(28)$

$=196a^2$

$7\cdot7\cdot2\cdot2$

$\underline{176}$

$1,176$

$2,98$

$4,49$

$7,28$

$14,14$

$7a^2+4a+49a+28=0$

$a(7a+4)+7(7a+4)=0$

$(7a+4)(a+7)=0$

$7a^2+49a+4a+28=0$

$7a(a+7)+4(a+7)=0$

$(a+7)(7a+4)=0$

Solutions

$a+7=0$

$a=7$

$7a+4=0$

$7a=-4$

$a=-\frac{4}{7}$

(8) $9k^2+66k+21=0$

GCF! $3(3k^2+22k+7)=0$

newAC $21k^2$ Add

$21$

$3, 7$

$3k^2+22k+7=0$

$3k^2+1k+21k+7=0$

$k(3k+1)+7(3k+1)=0$

$(3k+1)(k+7)=0$

---

$3k^2+21k+1k+7=0$

$3k(k+7)+1(k+7)=0$

$(k+7)(3k+1)=0$

Solutions $k+7=0$ $3k+1=0$

$k=-7$ $3k=-1$

$k=-\frac{1}{3}$

Completely factored $3(3k+1)(k+7)=0$

(9) $15n^2 - 27n - 6 = 0$ GCF "3"

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

$3[5n^2 - 10n + 1n - 2]$

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

$\boxed{3[(n-2)(5n+1)] = 0}$

AC $= -10n^2$ Subtract

1, 10

2, 5

Solutions

$n - 2 = 0$ $5n + 1 = 0$

$n = 2$ $5n = -1$

$n = -1/5$

OR

$3[5n^2 + 1n - 10n - 2] =$

$3[n(5n+1) - 2[5n+1]] = 0$

$\boxed{3[(5n+1)(n-2)] = 0}$

---

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

AC $45x^2$ ADD

1, 45

3, 15

5 9

$5x^2 - 15x - 3x + 9$

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

$(x-3)(5x-3) = 0$

Solutions

$5x - 3 = 0$ $x - 3 = 0$

$5x = 3$ $x = 3$

$x = \frac{3}{5}$

OR

$5x^2 - 3x - 15x + 9$

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

$(5x-3)(x-3) = 0$

(11) $4n^2 - 15n - 25 = 0$

$4n^2 - 20n + 5n - 25 = 0$

$4n(n-5) + 5(n-5) = 0$

$(n-5)(4n+5) = 0$

OR

$4n^2 + 5n - 20n - 25 = 0$

$n(4n+5) - 5(4n+5) = 0$

$(4n+5)(n-5) = 0$

$AC = -100n^2$ Subtract

1, 100
2, 50
4, 25
5, 20
10, 10

Solutions

$4n+5=0$ $\quad$ $n-5=0$

$4n=-5$ $\quad$ $n=5$

$n=-\frac{5}{4}$

---

(12) $4x^2 - 35x + 49 = 0$

$4x^2 - 28x - 7x + 49 = 0$

$4x(x-7) - 7(x-7) = 0$

$(x-7)(4x-7) = 0$

OR

$4x^2 - 7x - 28x + 49 = 0$

$x(4x-7) - 4(4x-7) = 0$

$(4x-7)(x-4) = 0$

$AC = 196x^2$ ADD

1, 196
2, 98
4, 49
7, 28
14 14

196
14 14
2 7 2 7

Solutions

$4x-7=0$ $\quad$ $x-4=0$

$4x=7$ $\quad$ $x=4$

$x=\frac{7}{4}$

(13) $4n^2 - 17n + 4 = 0$

$4n^2 - 1n - 16n + 4 = 0$

$n(4n-1) - 4(4n-1) = 0$

$(4n-1)(n-4) = 0$

OR

$4n^2 - 16n - 1n + 4 = 0$

$4n(n-4) - 1(n-4) = 0$

$(n-4)(4n-1) = 0$

AC $= 16n^2$ Add

16

1, 16

2, 8

4, 4

Solutions

$n - 4 = 0$ $\quad$ $4n - 1 = 0$

$n = 4$ $\quad$ $4n = 1$

$n = 1/4$

---

(14) $6x^2 + 7x - 49 = 0$

$6x^2 + 21x - 14x - 49 = 0$

$3x(2x+7) - 7(2x+7) = 0$

$(2x+7)(3x-7) = 0$

OR

$6x^2 - 14x + 21x - 49 = 0$

$2x(3x-7) + 7(3x-7) = 0$

$(3x-7)(2x+7) = 0$

AC $-294x^2$ subtract

1, 294

2, 147

3, 98

6, 49

7, 42

14, 21

294

6 49

2 3 7 7

Solutions

$3x - 7 = 0$ $\quad$ $2x + 7 = 0$

$3x = 7$ $\quad$ $2x = -7$

$x = 7/3$ $\quad$ $x = -\frac{7}{2}$

(15) $6x^2+37x+6=0$ $\quad$ $AC = 36x^2$ ADD

$6x^2+1x+36x+6=0$

$x(6x+1)+6(6x+1)=0$

$(6x+1)(x+6)=0$

| 36 |
|---|
| 1, 36 |
| 2, 18 |
| 3, 12 |
| 4, 9 |
| 6, 6 |

OR

$6x^2+36x+1x+6=0$

$6x(x+6)+1(x+6)=0$

$(x+6)(6x+1)=0$

Solutions

$x+6=0$ $\quad$ $6x+1=0$

$x=-6$ $\quad$ $6x=-1$

$x=-\frac{1}{6}$

---

(16) $-6a^2-25a-25=0$ I would always factor out "-1" if $a<0$

$-1(6a^2+25a+25)=0$

$-1(6a^2+10a+15a+25)=0$

$-1(2a(3a+5)+5(3a+5))=0$

$-1(3a+5)(2a+5)=0$

OR

$-1(6a^2+15a+10a+25)=0$

$-1(3a(2a+5)+5(2a+5))=0$

$-1(2a+5)(3a+5)=0$

$AC = 150a^2$

| 1, 150 |
|---|
| 2, 75 |
| 3, 50 |
| 5, 30 |
| 6, 25 |
| 10, 15 |

add

150

25 6

5 5 2 3

Solutions

$2a+5=0$ $\quad$ $3a+5=0$

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

$a=-\frac{5}{2}$ $\quad$ $a=-\frac{5}{3}$

(17) $6n^2+5n-6=0$

$6n^2+9n-4n-6=0$

$3n(2n+3)-2(2n+3)=0$

$(2n+3)(3n-2)=0$

OR

$6n^2-4n+9n-6=0$

$2n(3n-2)+3(3n-2)=0$

$(3n-2)(2n+3)=0$

$AC=-36n^2$ Subtract

36

1, 36

2, 18

3, 12

4, 9

6, 6

Solutions

$3n-2=0$ $\quad$ $2n+3=0$

$3n=2$ $\quad$ $2n=-3$

$n=\frac{2}{3}$ $\quad$ $n=\frac{-3}{2}$

---

(18) $16b^2+60b-100=0$

GCF 4

$4(4b^2+15b-25)=0$

$4(4b^2+20b-5b-25)=0$

$4(4b(b+5)-5(b+5))=0$

$4(b+5)(4b-5)=0$

OR

$4(4b^2-5b+20b-25)=0$

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

$4(4b-5)(b+5)=0$

$AC=-100b^2$ Subtract

1, 100

2, 50

4, 25

5, 20

10, 10

Solutions

$4b-5=0$ $\quad$ $b+5=0$

$4b=5$ $\quad$ $b=-5$

$b=\frac{5}{4}$