

① Finish Handout - All Types Mixed

② p. 198 1a, 2c, b, 3a, (c): 180ace, 24 ce,
28ab, 35*, 13ALL, 19ace, 25acf, 32ALL
Puzzle Sheet

1a)
$$\begin{array}{r|l} 2 & 594 \\ 3 & 297 \\ 3 & 99 \\ 3 & 33 \\ \hline & 11 \end{array}$$
 $594 = \boxed{2 \cdot 3^3 \cdot 11}$
 L stop

Extra!

2c)
$$\begin{array}{r|l} 2 & 176 & 320 & 368 \\ 2 & 88 & 160 & 184 \\ 2 & 44 & 80 & 92 \\ 2 & 22 & 40 & 46 \\ \hline & 11 & 20 & 23 \end{array}$$

b)
$$\begin{array}{r|l} 5 & 245 & 280 & 385 \\ 7 & 49 & 56 & 77 \\ & 7 & 8 & 11 \end{array}$$

 $GCF = 5 \cdot 7 = \boxed{35}$

$GCF: 2 \cdot 2 \cdot 2 \cdot 2 = \boxed{16}$

3a)
$$\begin{array}{r|l} \overset{GCF}{10} & 70 & 90 & 140 \\ 7 & 7 & 9 & 14 \\ & 1 & 9 & 2 \end{array}$$

$LCM = 10 \cdot 7 \cdot 9 \cdot 2 = \boxed{1260}$

$GCF = \boxed{10}$

c)
$$\begin{array}{r|l} 10 & 200 & 250 & 500 \\ 5 & 20 & 25 & 50 \\ 2 & 4 & 5 & 10 \\ & & \downarrow & \\ & 2 & 5 & 5 \end{array}$$

$GCF = \boxed{50}$

$LCM = 10 \cdot 5 \cdot 2 \cdot 2 \cdot 5 \cdot 5$

$LCM = \boxed{5000}$

18a) $(g+5)(g-4)$ } $\begin{array}{r} g+5 \\ g \quad \boxed{\begin{array}{|c|c|} \hline g^2 & 5g \\ \hline \end{array}} \\ -4 \quad \boxed{\begin{array}{|c|c|} \hline -4g & -20 \\ \hline \end{array}} \end{array}$ *combine like terms*

$g^2 - 4g + 5g - 20$

$\boxed{g^2 + 1g - 20}$ ←

c) $(k-4)(k+11)$

$k^2 + 11k - 4k - 44$

$\boxed{k^2 + 7k - 44}$

OR

$\begin{array}{r} k-4 \\ k \quad \boxed{\begin{array}{|c|c|} \hline k^2 & -4k \\ \hline \end{array}} \\ +11 \quad \boxed{\begin{array}{|c|c|} \hline 11k & -44 \\ \hline \end{array}} \end{array}$

$\boxed{k^2 + 7k - 44}$

c) $(12-t)(12-t)$

$144 - 12t - 12t + t^2$

$\boxed{144 - 24t + t^2}$

OR

$\boxed{t^2 - 24t + 144}$

$\begin{array}{r} 12-t \\ 12 \quad \boxed{\begin{array}{|c|c|} \hline 144 & -12t \\ \hline \end{array}} \\ -t \quad \boxed{\begin{array}{|c|c|} \hline -12t & +t^2 \\ \hline \end{array}} \end{array}$

$144 - 24t + t^2$

OR

$t^2 - 24t + 144$

24. c) $(2a-7)(2a-6)$

$4a^2 - 12a - 14a + 42$

$\boxed{4a^2 - 26a + 42}$

$\begin{array}{r} 2a-7 \\ 2a \quad \boxed{\begin{array}{|c|c|} \hline 4a^2 & -14a \\ \hline \end{array}} \\ -6 \quad \boxed{\begin{array}{|c|c|} \hline -12a & +42 \\ \hline \end{array}} \end{array}$

$\boxed{4a^2 - 26a + 42}$

28a) $(4m-p)^2$

$(4m-p)(4m-p)$

$16m^2 - 4mp - 4mp + p^2$

$\boxed{16m^2 - 8mp + p^2}$

$\begin{array}{r} 4m \quad -p \\ 4m \quad \boxed{\begin{array}{|c|c|} \hline 16m^2 & -4mp \\ \hline \end{array}} \\ -p \quad \boxed{\begin{array}{|c|c|} \hline -4mp & p^2 \\ \hline \end{array}} \end{array}$

$\boxed{16m^2 - 8mp + p^2}$

$$28b) (3g-4h)^2$$

$$(3g-4h)(3g-4h)$$

$$9g^2 - 12gh - 12gh + 16h^2$$

$$\boxed{9g^2 - 24gh + 16h^2}$$

$$3g - 4h$$

$$3g \begin{array}{|l} 9g^2 \\ -12gh \end{array}$$

$$-4h \begin{array}{|l} -12gh \\ +16h^2 \end{array}$$

$$\boxed{9g^2 - 24gh + 16h^2}$$

*C (35)

$$(2x+5)(2x+5) - (x+3)(x+3)$$

$$(4x^2+20x+25) - (x^2+6x+9)$$

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

$$-x^2-6x-9$$

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

$$\boxed{3x^2+14x+16}$$

$$- (x^2+6x+9)$$

$$\boxed{3x^2+14x+16}$$

1 1 1 1 1 1 1 1
2 2 2 2 2 3 3 3 2

GCF

$$3a) 8x^2 - 12x = \boxed{4x(2x-3)}$$

$$b) 3y^3 - 12y^2 + 15y = \boxed{3y(y^2 - 4y + 5)}$$

$$c) 4b^3 - 2b - 6b^2 = \boxed{2b(2b^2 - 1 - 3b)}$$

$$d) 6m^3 - 12m - 24m^2 = \boxed{6m(m^2 - 2 - 4m)}$$

Short Trinomials

$$19a) q^2 + 6q + 8$$

$$\begin{array}{l|l} P(8) & S(6) \\ 4, 2 & \end{array} \quad \boxed{(q+4)(q+2)}$$

$$c) 54 - 15s + s^2$$

$$\begin{array}{l|l} P(54) & S(-15) \\ -9, -6 & \end{array} \quad \begin{array}{l} (s-9)(s-6) \\ \text{or} \end{array}$$

$$e) x^2 - x - 20 = (x-5)(x+4)$$

$$\begin{array}{l|l} P(-20) & S(-1) \\ & \end{array} \quad (9-s)(6-s)$$

Long Trinomial

25a) $4k^2 - 7k + 3$

$a \cdot c = 4(3) = 12$

$P(12) \mid S(-7)$
 $-4, -3$

$$\begin{aligned} 4k^2 - 4k - 3k + 3 \\ (4k^2 - 4k) + (-3k + 3) \\ 4k(k-1) - 3(k-1) \end{aligned}$$

$$\boxed{(4k-3)(k-1)}$$

c) $4b^2 - 5b - 6$

$a \cdot c = 4(-6) = -24$

$P(-24) \mid S(-5)$
 $-8, +3$

$$\begin{aligned} 4b^2 - 8b + 3b - 6 \\ (4b^2 - 8b) + (3b - 6) \\ 4b(b-2) + 3(b-2) \end{aligned}$$

$$\boxed{(4b+3)(b-2)}$$

f) $21x^2 + 8x - 4$

$a \cdot c = (21)(-4) = -84$

$P(-84) \mid S(8)$
 $-6, 14$

$$\begin{aligned} 21x^2 - 6x + 14x - 4 \\ (21x^2 - 6x) + (14x - 4) \\ 3x(7x-2) + 2(7x-2) \end{aligned}$$

$$\boxed{(3x+2)(7x-2)}$$

Difference of Squares

32a) $81 - 4b^2$
 $\boxed{(9-2b)(9+2b)}$

b) $16v^2 - 49$
 $\boxed{(4v-7)(4v+7)}$

c) $64g^2 - 16h^2$
GCF $\sqrt{16}$ $(4g^2 - h^2)$
 $\boxed{16(2g-h)(2g+h)}$

d) $18m^2 - 2n^2$
GCF 2 $(9m^2 - n^2)$
 $\boxed{2(3m-n)(3m+n)}$

$$\textcircled{1} \quad 3n^2 - 17n + 24$$

$$\begin{array}{ccc} & \nearrow & \\ -8n & \times & -9n \\ & \searrow & \end{array}$$

-17n

$$\frac{(3n^2 - 8n)(-9n + 24)}{n \quad -3}$$

$$n(3n - 8) - 3(-3n + 8)$$

$$(3n - 8)(n - 3)$$

SR

$$\textcircled{2} \quad \frac{4x^3y - 49xy^3}{xy}$$

$$xy(4x^2 - 49y^2)$$

$$xy(2x + 7y)(2x - 7y)$$

UT

$$\textcircled{3} \quad \frac{5x^2 + 20xy - 60y^2}{5}$$

$$5(x^2 + 4xy - 12y^2)$$

$$\begin{array}{ccc} & \nearrow & \\ -2xy & \times & 6xy \\ & \searrow & \end{array}$$

4xy

$$(x^2 - 2xy) + (6xy - 12y^2)$$

$$x(x - 2y) + 6y(x - 2y)$$

$$5(x - 2y)(x + 6y)$$

EF

$$\textcircled{4} \quad \frac{(3x^3 - x^2y)(12x - 4y)}{x^2 \quad 4}$$

$$x^2(3x - y) + 4(3x - y)$$

$$(3x - y)(x^2 + 4)$$

LL

$$\textcircled{5} \quad \frac{2x^4y - 3x^3y - 20x^2y}{x^2y}$$

$$x^2y(2x^2 - 3x - 20)$$

$$\begin{array}{ccc} & \nearrow & \\ -8x & \times & 5x \\ & \searrow & \end{array}$$

-40

$$(2x^2 - 8x) + (5x - 20)$$

$$\frac{2x}{2x} \quad \frac{5}{5}$$

$$2x(x - 4) \quad 5(x - 4)$$

$$(x - 4)(2x + 5)$$

$$x^2y(x - 4)(2x + 5)$$

AN

$$\textcircled{6} \quad \frac{9x^3y + 33x^2y^2 + 30xy^3}{3x^2y}$$

$$3x^2y(3x^2 + 11xy + 10y^2)$$

$$\begin{array}{ccc} & \nearrow & \\ 6xy & \times & 5xy \\ & \searrow & \end{array}$$

30

$$(3x^2 + 6xy) + (5xy + 10y^2)$$

$$\frac{3x}{3x} \quad \frac{5y}{5y}$$

$$3xy(3x + 5y)(x + 2y)$$

TH

$$\textcircled{7} \underline{16a^3b^4 + 40a^2b^3 + 8ab^3}$$

$$8ab^3$$

$$8ab^3 (2a^2b + 5ab^2 + 1) \quad \textcircled{TE}$$

$$\textcircled{8} t^4 - 37t^2 + 36$$

$$\begin{array}{ccc} & \nearrow & \\ -1t^2 & 36 & \\ & \searrow & \\ & -36t^2 & \\ & \nwarrow & \\ & -37t^2 & \end{array}$$

$$\frac{(t^2 - 1t^2)(36t^2 + 36)}{t^2 \quad -36}$$

$$t^2(t^2 - 1) - 36(t^2 - 1)$$

$$(t^2 - 1)(t^2 - 36)$$

$$(t+1)(t-1)(t+6)(t-6) \quad YQ$$

$$\textcircled{9} \underline{2a^7b^3 - 288ab}$$

$$2ab$$

$$2ab(a^6b^2 - 144)$$

$$2ab(a^3b + 12)(a^3b - 12)$$

AT

try switching these!

$$\textcircled{10} \text{ next pg. } (35a^2b - 5a)(7ab^2 + b)$$

$$\text{Hmm... } \underset{5a}{5a}(7ab - 5) - \underset{-b}{b}(7ab -$$

$$\#10 \left(\frac{35a^2b - 7ab^2}{7ab} \right) (-5a + b)$$

$$\#11 \quad 7ab(5a-b) - 1(5a-b) \Rightarrow (5a-b)(7ab-1) \quad \text{(UL)}$$

$$\textcircled{10} \quad \frac{6a^4b^2 - 11a^3b^3 + 4a^2b^4}{a^2b^2}$$

$$a^2b^2 (6a^2 - 11ab + 4b^2)$$

$$\begin{array}{ccc} & 24 & \\ \swarrow & & \searrow \\ -3ab & & -8ab \end{array}$$

$$\begin{array}{ccc} (6a^2 - 3ab) & (-8ab + 4b^2) & \\ \hline 3a & -4b & \end{array}$$

$$3a(2a-b) - 4b(2a-b)$$

$$a^2b^2 (3a-4b)(2a-b) \quad \text{(EA)}$$

$$\textcircled{11} \quad \frac{6a^4b^2 - 11a^3b^3 + 4a^2b^4}{a^2b^2}$$

$$a^2b^2 (6a^2 - 11ab + 4b^2)$$

$$\begin{array}{ccc} & 24 & \\ \swarrow & & \searrow \\ -3ab & & -8ab \end{array}$$

Whoops!
Already done!

$$\#12 \quad t^2(t+3) + 6t(t+3) + 9(t+3)$$

$$(t+3)(t^2 + 6t + 9)$$

$$\begin{array}{ccc} & 9 & \\ \swarrow & & \searrow \\ 3 & 6 & 3 \end{array}$$

$$(t+3)(t+3)(t+3) = (t+3)^3$$