section 5.3

178-a) $(6y^7)(-3y^4) = (6)(-3)(y^7)(y^4) = \underline{-18y^{11}}$

178-b) $\left(\frac{4}{7}rs^2\right)(14rs^3) = \left(\frac{4}{7}\right)(14)(rs^2)(rs^3) = \underline{8r^2s^6}$

180-a) $(-8u^6)(-9u) = (-8)(-9)(u^6)(u) = \underline{72u^7}$

180-b) $\left(\frac{2}{3}x^2y\right)\left(\frac{3}{4}xy^2\right) = \left(\frac{2}{3}\right)\left(\frac{3}{4}\right)(x^2y)(xy^2) = \underline{\frac{1}{2}x^3y^3}$

182-a) $-8x(x^2+2x-15) = \underline{-8x^3-16x^2+120x}$

182-b) $5pq^3(p^2-2pq+6q^2) = \underline{5p^3q^3-10p^2q^4+30pq^5}$

184-a) $-8y(y^2+2y-15) = \underline{-8y^3-16y^2+120y}$

184-b) $-4y^2z^2(3y^2+12yz-z^2) = \underline{-12y^4z^2-48y^3z^3+4y^2z^4}$

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186) $(w+5)(w+7) = w^2+7w+5w+35$

$= \underline{w^2+12w+35}$

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188) $(4p+11)(5p-4) = 20p^2-16p+55p-44$

$= \underline{20p^2+39p-44}$

190) $(x+8)(x+3) = x^2+3x+8x+24$

$= x^2+11x+24$

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192) $(2t-9)(10t+1) = 20t^2+2t-90t-9$

$= 20t^2-88t-9$

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194) $(q-5)(q+8) = q^2+8q-5q-40$

$= q^2+3q-40$

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196) $(7m+1)(m-3) = 7m^2-21m+m-3$

$= 7m^2-20m-3$

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198) $(x^2+3)(x+2) = x^3+2x^2+3x+6$

$= x^3+2x^2+3x+6$

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200) $(5ab-1)(2ab+3) = 10a^2b^2+15ab-2ab-3$

$= 10a^2b^2+13ab-3$

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202) $(x^2+8)(x^2-5) = x^4-5x^2+8x^2-40$

$= x^4+3x^2-40$

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204) $(6pq-3)(4pq-5) = 24p^2q^2-30pq-12pq+15$

$= 24p^2q^2-42pq+15$

206) $(x+5)(x^2+4x+3) = x^3+4x^2+3x+5x^2+20x+15$

$= x^3+9x^2+23x+15$

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208) $(y+8)(4y^2+y-7) = 4y^3+y^2-7y+32y^2+8y-56$

$= 4y^3+33y^2+y-56$

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210) $(y^2-3y+8)(4y^2+y-7) = 4y^4+y^3-7y^2-12y^3-3y^2+21y+32y^2+8y-56$

$= 4y^4+-11y^3+22y^2+29y-56$

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212) $(w-7)(w^2-9w+10) = w^3-9w^2+10w-7w^2+63w-70$

$= w^3-16w^2+73w-70$

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214) $(3q+1)(q^2-4q-5) = 3q^3-12q^2-15q+q^2-4q-5$

$= 3q^3-11q^2-19q-5$

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216) $(w+4)^2 = (w+4)(w+4) = w^2+4w+4w+16$

$= w^2+8w+16$

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218) $(3x-y)^2 = (3x-y)(3x-y) = 9x^2-3xy-3xy+y^2$

$= 9x^2-6xy+y^2$

220) $\left(y+\frac{1}{4}\right)^2=\left(y+\frac{1}{4}\right)\left(y+\frac{1}{4}\right)=y^2+\frac{1}{4}y+\frac{1}{4}y+\frac{1}{16}$

$=y^2+\frac{2}{4}y+\frac{1}{16}=y^2+\frac{1}{2}y+\frac{1}{16}$

222) $\left(\frac{1}{5}x-\frac{1}{7}y\right)^2=\left(\frac{1}{5}x-\frac{1}{7}y\right)\left(\frac{1}{5}x-\frac{1}{7}y\right)=\frac{1}{25}x^2-\frac{1}{35}xy-\frac{1}{35}xy+\frac{1}{49}y^2$

$=\frac{1}{25}x^2-\frac{2}{35}xy+\frac{1}{49}y^2$

224) $(3x^2+2)^2=(3x^2+2)(3x^2+2)=9x^4+6x^2+6x^2+4$

$=9x^4+12x^2+4$

226) $(4y^3-2)^2=(4y^3-2)(4y^3-2)=16y^6-8y^3-8y^3+4$

$=16y^6-16y^3+4$

228) $(5k+6)(5k-6)=25k^2-30k+30k-36=25k^2-36$

230) $(11k+4)(11k-4)=121k^2-44k+44k-16=121k^2-16$

232) $(9c-2d)(9c+2d)=81c^2+18cd-18cd-4d^2=81c^2-4d^2$

234) $\left(m+\frac{2}{3}n\right)\left(m-\frac{2}{3}n\right)=m^2-\frac{2}{3}mn+\frac{2}{3}mn-\frac{4}{9}n^2=m^2-\frac{4}{9}n^2$

236) $(ab-4)(ab+4)=a^2b^2+4ab-4ab-16=a^2b^2-16$

238) $(12p^3-11q^2)(12p^3+11q^2) = 144p^6+132p^3q^2-132p^3q^2-121q^4$

$= 144p^6-121q^4$

240) $(p-3)(p+3) = p^2+3p-3p-9 = p^2-9$

242) $(m+n)^2 = (m+n)(m+n) = m^2+mn+mn+n^2 = m^2+2mn+n^2$

244) $(2r+12)^2 = (2r+12)(2r+12) = 4r^2+24r+24r+144 = 4r^2+48r+144$

246) $(7a+b)(a-7b) = 7a^2-49ab+ab-7b^2 = 7a^2-48ab-7b^2$

248) $(a^5-7b)^2 = (a^5-7b)(a^5-7b) = a^{10}-7a^5b-7a^5b+49b^2 = a^{10}-14a^5b+49b^2$

250) $(r^6+s^6)(r^6-s^6) = r^{12}-r^6s^6+r^6s^6-s^{12} = r^{12}-s^{12}$

252) $(x^5+y^5)(x^5-y^5) = x^{10}-x^5y^5+x^5y^5-y^{10} = x^{10}-y^{10}$

254) $(9p+8q)^2 = (9p+8q)(9p+8q) = 81p^2+72pq+72pq+64q^2$

$= 81p^2+144pq+64q^2$

256) $(10y-6)+(4y-7) = 10y-6+4y-7 = 14y-13$

258) $(x^2-4x-34)-(x^2+7x-6) = x^2-4x-34-x^2-7x+6 = -11x-28$

260) $\left(\frac{1}{5}t^8\right)(20t^3) = \left(\frac{1}{5}\right)(20)(t^8)(t^3) = \underline{\underline{4t^{11}}}$

262) $(4a^3b)(9a^2b^6) = \underline{\underline{36a^5b^7}}$

264) $-5m(m^2+3m-18) = \underline{\underline{-5m^3-15m^2+90m}}$

266) $(s-7)(s+9) = s^2+9s-7s-63 = \underline{\underline{s^2+2s-63}}$

268) $(5x-y)(x-4) = 5x^2-20x-xy+4y = \underline{\underline{5x^2-20x-xy+4y}}$

270) $(3x-11y)(3x-11y) = 9x^2-33xy-33xy+121y^2$
$= \underline{\underline{9x^2-66xy+121y^2}}$

272) $\left(rs-\frac{2}{7}\right)\left(rs+\frac{2}{7}\right) = r^2s^2+\frac{2}{7}rs-\frac{2}{7}rs-\frac{4}{49} = \underline{\underline{r^2s^2-\frac{4}{49}}}$

274) $(m-15)^2 = (m-15)(m-15) = m^2-15m-15m+225$
$= \underline{\underline{m^2-30m+225}}$

274) $(4a+10)^2 = (4a+10)(4a+10) = 16a^2+40a+40a+100$
$= \underline{\underline{16a^2+80a+100}}$

278) $f(x) = x+2$ $\quad g(x) = 3x^2 - 2x + 4$

a) $(f \cdot g)(x) = f(x)\,g(x) = (x+2)(3x^2 - 2x + 4)$

$= 3x^3 - 2x^2 + 4x + 6x^2 - 4x + 8 = \underline{3x^3 + 4x^2 + 8}$

b) $(f \cdot g)(-1) = f(-1)\,g(-1) = ((-1)+2)(3(-1)^2 - 2(-1) + 4) = (1)(3+2+4) = \underline{9}$

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280) $f(x) = 2x - 7$ $\quad g(x) = 2x + 7$

a) $(f \cdot g)(x) = f(x)\,g(x) = (2x-7)(2x+7) = 4x^2 + 14x - 14x - 49 = \underline{4x^2 - 49}$

b) $(f \cdot g)(-3) = f(-3)\,g(-3) = (2(-3)-7)(2(-3)+7) = (-6-7)(-6+7) = (-13)(1) = \underline{-13}$

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282) $f(x) = x^2 - 5x + 2$ $\quad g(x) = x^2 - 3x - 1$

a) $(f \cdot g)(x) = f(x)\,g(x) = (x^2 - 5x + 2)(x^2 - 3x - 1)$

$= x^4 - 3x^3 - x^2 - 5x^3 + 15x^2 + 5x + 2x^2 - 6x - 2$

$= \underline{x^4 - 8x^3 + 16x^2 - x - 2}$