$$\frac{a}{b}\cdot\frac{c}{d}=\frac{ac}{bd} \qquad \frac{a}{b}\div\frac{c}{d}=\frac{a}{b}\cdot\frac{d}{c}$$

for division, flip and multiply

$b\neq 0,\ d\neq 0$ $\quad$ $c\neq 0$

Ex 3

(a) $\dfrac{2y^2}{9}\cdot\dfrac{27}{8y^5}=\dfrac{2\cdot y\cdot y\cdot 3\cdot 9}{9\cdot 2\cdot 4\cdot y\cdot y\cdot y\cdot y\cdot y}=\boxed{\dfrac{3}{4y^3}}$

(b) $\dfrac{3m^2-2m-8}{3m^2+14m+8}\cdot\dfrac{3m+2}{3m+4}$

$3m^2+14m+8$ $\quad$ $24\mid 14$, $12\cdot 2\mid 12+2$

$3m^2+12m+2m+8$

$3m \quad 3m \quad 2 \quad 2$

$3m(m+4)+2(m+4)$

$\boxed{(m+4)(3m+2)}$

$3m^2-2m-8$

$ac \quad b$

$-24\mid -2$

$-6(4)\mid -6+4=-2$

$3m^2-6m+4m-8$

$3m \quad 3m \quad 4 \quad 4$

$3m(m-2)+4(m-2)$

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

$\dfrac{(m-2)(3m+4)}{(m+4)(3m+2)}\cdot\dfrac{3m+2}{3m+4}$

$\boxed{\dfrac{m-2}{m+4}}$ Lowest terms

(c) $\dfrac{3p^2+11p-4}{24p^3-8p^2} \div \dfrac{9p+36}{24p^4-36p^3}$

$= \dfrac{(p+4)(3p-1)}{8p^2(3p-1)} \cdot \dfrac{24p^4-36p^3}{9p+36}$ → $\left\{\dfrac{24p^4}{12p^3} \quad \dfrac{-36p^3}{12p^3} \quad 12p^3(2p-3)\right\}$

$= \dfrac{(p+4)(3p-1)}{8p^2(3p-1)} \cdot \dfrac{12p^3(2p-3)}{9(p+4)}$

$= \dfrac{12p^3(2p-3)}{8p^2 \cdot 9} = \dfrac{3 \cdot 4\, p^3(2p-3)}{2 \cdot 4\, p^2 \cdot 3 \cdot 3}$

$= \boxed{\dfrac{p(2p-3)}{6}}$

(d) $\dfrac{x^3-y^3}{x^2-y^2} \cdot \dfrac{2x+2y+xz+yz}{2x^2+2y^2+zx^2+zy^2}$ → $\dfrac{2x}{z}+\dfrac{2y}{z}+\dfrac{xz}{z}+\dfrac{yz}{z}$

$2(x+y)+z(x+y)$

$= \dfrac{(x-y)(x^2+xy+y^2)}{(x-y)(x+y)} \cdot \dfrac{(x+y)(2+z)}{2(x^2+y^2)+z(x^2+y^2)}$

$= \dfrac{x^2+xy+y^2}{x+y} \cdot \dfrac{(x+y)(2+z)}{(x^2+y^2)(2+z)}$

$= \boxed{\dfrac{x^2+xy+y^2}{x^2+y^2}}$

HW #33, 43, 47 HW
CW #34, 44, 48