Working with exponents - worksheet

1.12 *(4g)

Q- $\left(\frac{5^1 a^2}{2^1 b^3}\right)^2$

$= \frac{5^{1\times2}\ a^{(2\times2)}}{2^{1\times2}\ b^{(3\times2)}}$ Power Rule

$= \frac{5^2\ a^4}{2^2\ b^6}$

final answer $= \frac{25\ a^4}{4\ b^6}$

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1.12 worksheet

5) a) $(5a^3)(3a^6)$ Product Rule

$5 \times 3 = 15$

$3+6$

$= 15a$

$= 15a^9$

c) $(3a^2b^3)(2a^1b^1)$ invisible 1

$= (3 \times 2)(a^2)(a^1)(b^3)(b^1)$

$= 6a^{2+1}b^{3+1}$

$= 6a^3b^4$

Exercise 1.12

like 6f)

$$(-18a^5b^3) \div (-2ab^1)$$

$$= \frac{-18a^5b^3}{-2ab^1} = 9a^{5-1}b^{3-1}$$

$$= 9a^4b^2$$

Separate each division

$(-18) \div (-2) = 9$

$a^5 \div a^1 = a^4$

$b^3 \div b^1 = b^2$

Then multiply the quotients!

$= 9a^4b^2$

#7b) $\left[(3x^1)(x^2)\right]^2$

$= (3x^{1+2})^2$

$= (3^1 x^3)^2$

$= 3^{1\times 2} x^{3\times 2}$

$= 3^2 x^6$

$= 9x^6$

7c) $\left(\frac{12x^5}{4x^3}\right)^2$

$= \left[(12 \div 4)(x^{5-3})\right]^2$

$= (3^1 x^2)^2$

$= 3^{1\times 2} x^{2\times 2}$

$= 3^2 x^4$

$= 9x^4$

$3^2 = 3\times 3$

$= 9$

#7d) Simplify

$$[(2a^3b)(3a^4)]^2$$

follow BEDMAS

$$= [6a^3a^4b]^2$$

Product Rule

$$= [6a^{7}b^{1+2}]$$

Power Rule

$$= 6^{1\times2}a^{7\times2}b^{1\times2}$$

$$= 6^2a^{14}b^2$$

$$\boxed{= 36a^{14}b^2}$$

like #7h)

$$\left(\frac{5a^3x}{15a^2}\right)^3$$

$$= \left[\left(\frac{1}{3}\right)\left(a^{3-2}\right)\left(x\right)\right]^3$$

$$= \left(\frac{1^1 a^1 x^1}{3^1}\right)^3$$

$$= \frac{1^{1\times3}\, a^{1\times3}\, x^{1\times3}}{3^{1\times3}}$$

$$= \frac{1^3 a^3 x^3}{3^3}$$

$3^3 = 3\times3\times3$
$= 9\times3$
$= 27$

$$= \frac{1a^3x^3}{27}$$

$$= \frac{a^3x^3}{27}$$

#8a) $(2x^2)^3(2x^5)$

$= (2^{1\times3}\, x^{2\times3})(2x^5)$

$= (2^3\, x^6)(2x^5)$

$2^3 = 2\times2\times2$
$= 4\times2$
$= 8$

$= (8x^6)(2x^5)$

$= 16x^{6+5}$

$= 16x^{11}$

#8b) $\dfrac{(8ab^2)(3a^2b)}{12a^3}$ ← first simplify numerator!

$= \dfrac{24a^3b^3}{12a^3}$

$\dfrac{24}{12} = 2$

$\dfrac{a^3}{a^3} = a^0 = 1$

$= 2(1)(b^3)$

$= 2b^3$

#8c) $\dfrac{(3^1x^2y^5)^3}{9xy^2}$

$= \dfrac{3^{1\times3}\,x^{2\times3}\,y^{5\times3}}{9xy^2}$

$= \dfrac{3^3x^6y^{15}}{9xy^2}$

$= \dfrac{27x^5y^{13}}{9} = \boxed{3x^5y^{13}}$

Exercise 1.12

8) Simplify

liked) $\dfrac{(12m^3n^5)(-5m^1n^3)}{15m^3n^2}$

$= \dfrac{-60m^4n^8}{15m^3n^2}$

$= (-60\div15)m^{4-3}n^{8-2}$

$= -4m^1n^6$

#8e) $\dfrac{(-12x^2)(-4x^2y)}{(-6x^3)}$

$(-12)\times(-4) = 48$

$= \dfrac{48x^{2+2}y}{-6x^3}$

$= [48 \div (-6)](x^4 \div x^3)(y)$

$= -8x^1y$

#8f) $\dfrac{-32m^{10}n^3}{(8m^5)(mn)}$

$= \dfrac{-32m^{10}n^3}{+8m^{5+1}n}$

$= \dfrac{-32m^{10}n^3}{8m^6n}$

$= -4m^4n^2$