

EXPONENT LAWS QUIZ

11U

30

No calculators allowed!

1. Simplify. Express answers with positive exponents only. (16 marks total)

a) $\frac{(6a^2b^2)(4a^2b)}{12ab^2}$

4
 $= \frac{2a^4b^3}{ab^2}$ ✓
 $= 2a^3b$ ✓

b) $\frac{12m^{-3}n^4}{(8m^{-4}n)(3m^8)}$

$= \frac{1m^{-3}n^4}{2m^4n}$ ✓
 $= \frac{n^3}{2m^7}$ ✓

c) $(x^2y^{-4})(x^3y^2)^{-2}$

6
 $= \frac{x^2y^{-4}}{(x^3y^2)^2}$ ✓
 $= \frac{x^2y^{-4}}{x^6y^4}$ ✓
 $= \frac{1}{x^4y^8}$ ✓

d) $\frac{(3a^{-5}b^7)^2(ab^{-9})}{a^{10}b^{-2}}$

$= \frac{(9a^{-10}b^{14})(ab^{-9})}{a^{10}b^{-2}}$ ✓
 $= \frac{9a^{-9}b^5}{a^{10}b^{-2}}$ ✓
 $= \frac{9b^7}{a^{19}}$ ✓

e) $\left(\frac{8x^3y^{-1}z^{-1}}{8x^{-4}y^0z^0}\right)^3$

6
 $= \left(\frac{x^7}{3yz}\right)^3$ ✓
 $= \frac{x^{21}}{27y^3z^3}$ ✓

f) $\sqrt{\frac{(25x)^{\frac{1}{2}}(8x^2)^{\frac{1}{3}}}{40x^{\frac{1}{6}}}}$

$= \left[\frac{5x^{\frac{1}{2}} \cdot 2x^{\frac{2}{3}}}{40x^{\frac{1}{6}}}\right]^{\frac{1}{2}}$ ✓
 $= \left[\frac{x^{\frac{7}{6}}}{4x^{\frac{1}{6}}}\right]^{\frac{1}{2}}$ ✓
 $= \left[\frac{x}{4}\right]^{\frac{1}{2}} = \frac{\sqrt{x}}{2}$ ✓
 $= \frac{x^{\frac{1}{2}}}{2}$ ✓

$\frac{1}{2} + \frac{2}{3}$
 $= \frac{3}{6} + \frac{4}{6}$
 $= \frac{7}{6}$

16

Name: _____

2. Write in exponential form. (1 mark each)

2 a) $(\sqrt[5]{x})^2$
 $= x^{2/5}$ ✓

b) $(\sqrt{z})^3$
 $= z^{3/2}$ ✓

3. Write in radical form. (1 mark each)

2 a) $x^{3/2}$
 $= \sqrt{x^3}$ ✓

b) $a^{5/4}$
 $= \sqrt[4]{a^5}$ ✓

4. Evaluate. Do not use a calculator. (10 marks total)

6 a) $4^{3/2}$
 $= (2)^3$
 $= 8$ ✓

b) $-8^{4/3}$
 $= -2^4$
 $= -16$ ✓

c) $(\sqrt[3]{64})^2$
 $= 4^2$
 $= 16$ ✓

d) $\left(\sqrt[3]{125^{1/3} + 32^{4/5} + 36^{1/2}}\right)^2$
 $= (5 + 16 + 6)^{2/3}$ ✓
 $= 27^{2/3}$ ✓
 $= 3^2$ ✓
 $= 9$ ✓