Welcome Back MYP Math 9!

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: 1/29 Topic:_____	0 1 2	I rested after FINALS :)
Tuesday Date: 1/30 Topic:_____	0 1 2	New Semester!
Wednesday Date: 1/31 Topic: 2B Index Laws	0 1 2	
Thursday Date: _____ Topic:_____	0 1 2	
Friday Date: _____ Topic:_____	0 1 2	

Applying Properties of Exponents (Indices)

Warm-up:

Simplify. Your answer should contain only positive exponents.

$$\frac{3m^5n^0p^3}{2m^{-4}p^{-5}}$$

(m) $5 - -4 = 9$

(p) $3 - -5 = 8$

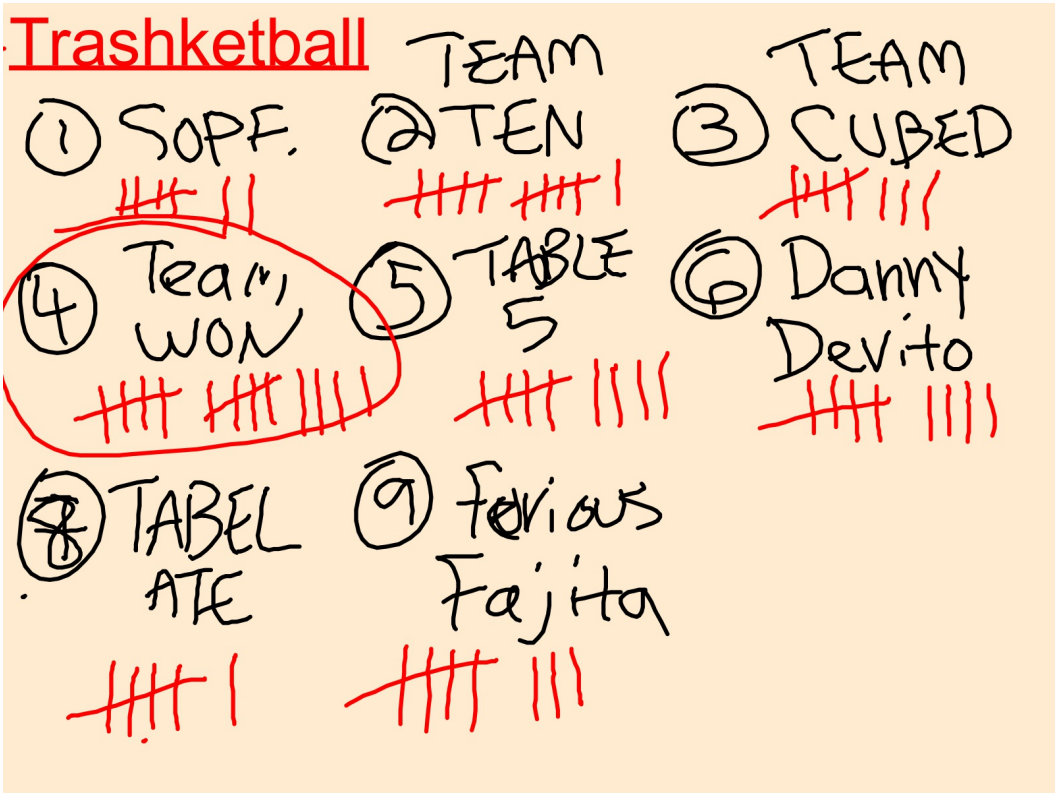
$$= \frac{3m^5p^3}{2m^{-4}p^{-5}} = \frac{3}{2}m^9p^8$$

Class Plan:

1. Warm-up
2. Homework Questions?
3. Apply Index Laws

http://susanleesensei.weebly.com/uploads/3/8/5/5/38550129/3170661-orig.jpg?500

Think of a team name for your table.


Trashketball
TEAM
1 SOPF.
2 TEN
TEAM
3 CUBED
4 Team WON
5 TABLE 5
6 Danny Devito
8 TABEL ATE
9 Ferious Fajita

Trashketball

1. Work together to put 1 solution on your board, **wait** to hold it up until told.

2. If your table is correct, your team gets 1 point.

3. Correct?? 2 parts A person from each ***table*** gets to shoot for 1,2 or 3 bonus points

4. Teacher is the judge - if you are taking too long - or losing focus - you lose your shot :) Stay on your game!

Apply Properties of Exponents

B INDEX LAWS

Product Property of Exponents

$$a^m \cdot a^n = a^{m+n}$$

Quotient Property of Exponents

$$\frac{a^m}{a^n} = a^{m-n}$$

Definition of Negative Exponents

$$a^{-n} = \frac{1}{a^n} \quad \text{or} \quad \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$$

Zero Exponents

$$a^0 = 1$$

Power of a Power Property

$$(a^m)^n = a^{mn}$$

Simplify. Your answer should contain only positive exponents.

1) $5^4 \cdot 5^3$

Simplify. Your answer should contain only positive exponents.

2) $4 \cdot 4^{4} \cdot 4^{6}$

Simplify. Your answer should contain only positive exponents.

3) $(aa^2)^2$

Simplify. Your answer should contain only positive exponents.

4) $2x \cdot \left(x^4\right)^{-3}$

Simplify. Your answer should contain only positive exponents.

5) $\left(4^{3}\right)^{4}$

Simplify. Your answer should contain only positive exponents.

6) $\left(4^{-3}\right)^{2}$

Simplify. Your answer should contain only positive exponents.

7) $2^4 \cdot (2^3)^2$

Simplify. Your answer should contain only positive exponents.

8) $\left(2^{-3}\right)^{-4} \cdot 2^{-1}$

Simplify. Your answer should contain only positive exponents.

9) $\dfrac{4^3}{4^2}$

Simplify. Your answer should contain only positive exponents.

10) $\dfrac{4^4}{4^{-1}}$

Simplify. Your answer should contain only positive exponents.

11) $\frac{4y}{y^3}$

Simplify. Your answer should contain only positive exponents.

12) $\dfrac{2u^3}{uv^2}$

Simplify. Your answer should contain only positive exponents.

13) $\dfrac{nm^3 \cdot 2m^4n^2 \cdot n}{4mn}$

$\dfrac{2m^7n^4}{4mn} = \dfrac{m^6n^3}{2}$

Simplify. Your answer should contain only positive exponents.

14) $\dfrac{2mn^3}{4m^{-1} \cdot 2m^3 n^3}$

Simplify. Your answer should contain only positive exponents.

15) $u^5v^4 \cdot u^3v^6 \cdot \left(u^{-5}v^3\right)^{-1}$

$u^{13}v^7$

Simplify. Your answer should contain only positive exponents.

16) $\left(u^5 v^{-3}\right)^4 \cdot \left(u^4 v^2\right)^{-2}$

$= u^{20} v^{-12} u^{-8} v^{-4}$

$= u^{12} v^{-16}$

$= \boxed{\dfrac{u^{12}}{v^{16}}}$

Simplify. Your answer should contain only positive exponents.

17) $\left(m^{0}n^{-3}\right)^{6} \cdot m^{4}n^{4}$

Simplify. Your answer should contain only positive exponents.

18) $m^{-6}n^{6} \cdot \left(m^{6}n^{-3}\right)^{-3}$

Simplify. Your answer should contain only positive exponents.

19) $\dfrac{2x^{1}y^{2}z^{4}}{x^{-5}y^{-1}z^{-5}}$ $= 2x^{6}y^{3}z^{9}$

$1 - -5 = 6$

$2 - -1 = 3$

$4 - -5 = 9$

Simplify. Your answer should contain only positive exponents.

20) $\dfrac{mqp^{-3}}{6m^5p^2q^{-3}}$

Simplify. Your answer should contain only positive exponents.

21) $\dfrac{3p^2q^{-2}}{3m^2p^4q^{-3}\cdot 6p^4q^6}$

$\dfrac{3p^2q^{-2}}{18m^2p^8q^3} = \boxed{\dfrac{1}{6m^2p^6q^5}}$

Simplify. Your answer should contain only positive exponents.

22) $\dfrac{3x^3y^6z^3 \cdot 6x^{-1}y^{-1}z^4}{x^3y^3z^5}$

Simplify. Your answer should contain only positive exponents.

23) $\dfrac{y^{-4}z^{-4}\cdot\left(y^{2}z^{4}\right)^{2}}{x^{0}y^{-6}z^{6}}$

$= \dfrac{y^{-4}z^{-4}y^{4}z^{8}}{y^{-6}z^{6}} = \dfrac{z^{4}}{y^{-6}z^{6}}$

$= \boxed{\dfrac{y^{6}}{z^{2}}}$

Simplify. Your answer should contain only positive exponents.

24) $\dfrac{a^4b^{-6}\cdot a^2b^{-3}c^5\cdot a^4b^{-1}c^0}{(b^3)^{-5}}$

$\dfrac{a^{10}b^{-10}c^5}{b^{-15}} = a^{10}b^5c^5$

Simplify. Your answer should contain only positive exponents.

25) $\dfrac{x y^{4} z^{-1} \cdot x^{5} y^{6} z^{6}}{\left(x^{6} y^{0} z^{-5}\right)^{6}}$

$= \dfrac{x^{6} y^{10} z^{5}}{x^{36} z^{-30}}$

$= \dfrac{y^{10} z^{35}}{x^{30}}$

Simplify. Your answer should contain only positive exponents.

26) $\dfrac{\left(x^4 y^0 z^4\right)^{-5}}{z x^{-4} y^{-4} \cdot x^6 y^{-6} z^3}$

$= \dfrac{x^{-20} z^{-20}}{x^2 y^{-10} z^4}$

$= \dfrac{y^{10}}{x^{22} z^{24}}$

Solutions to exercises:

1) 5^7

2) 4^{11}

3) a^6

4) $\frac{2}{x^{11}}$

5) 4^{12}

6) $\frac{1}{4^6}$

7) 2^{10}

8) 2^{11}

9) 4

10) 4^5

11) $\frac{4}{y^2}$

12) $\frac{2u^2}{v^2}$

13) $\frac{n^3m^6}{2}$

14) $\frac{1}{4m}$

15) $u^{13}v^7$

16) $\frac{u^{12}}{v^{16}}$

17) $\frac{m^4}{n^{14}}$

18) $\frac{n^{15}}{m^{24}}$

19) $2x^6y^3z^9$

20) $\frac{q^4}{6p^5m^4}$

21) $\frac{1}{6q^5m^2p^6}$

22) $\frac{18z^2y^2}{x}$

23) $\frac{y^6}{z^2}$

24) $a^{10}c^5b^5$

25) $\frac{z^{35}y^{10}}{x^{30}}$

26) $\frac{y^{10}}{x^{22}z^{24}}$

Exercises...

Complete Index Laws/Properties of Exponents WS

(Look back at 2B Index Laws Exercises if you're not yet feeling confident)