Curriculum Outcome

(N1) Demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents by: representing repeated multiplication using powers; using patterns to show that a power with an exponent of zero is equal to one; solving problems involving powers.

(N2) Demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents.

Student Friendly:
“Laws of exponents :
What happens to the exponent when you multiply like bases?"

Warm Up
Grade 9

1) Write the following as a repeated multiple and evaluate

a) $(-3)^5$

$= (-3)(-3)(-3)(-3)(-3)$

$= -243$

b) $-(-2)^3$

$= -(-2)(-2)(-2)$

$= -(-8)$

$= 8$

c) $-(-2)^6$

$= -(-2)(-2)(-2)(-2)(-2)(-2)$

$= -(64)$

$= -64$

d) $-(3)^0(-4)^3$

$= -(1)(-4)(-4)(-4)$

$= -(1)(-64)$

$= 64$

2) Write as a power then evaluate

a) $-(2)(2)(2)(-3)(-3)(3)(3)$

$= -(2)^3(-3)^2(3)^2$

$= -(8)(9)(9)$

$= -648$

b) $(-5)(-5)(4)(4)(4)(4)(4)$

$= (-5)^2(4)^5$

$= (25)(1024$

$= 25\,600$

3) Write the following as a powers of 10:

a) 68 706 324

$= (6 \times 10^7) + (8 \times 10^6) + (7 \times 10^5) + (6 \times 10^3) + (3 \times 10^2) + (2 \times 10^1) + (4 \times 10^0)$

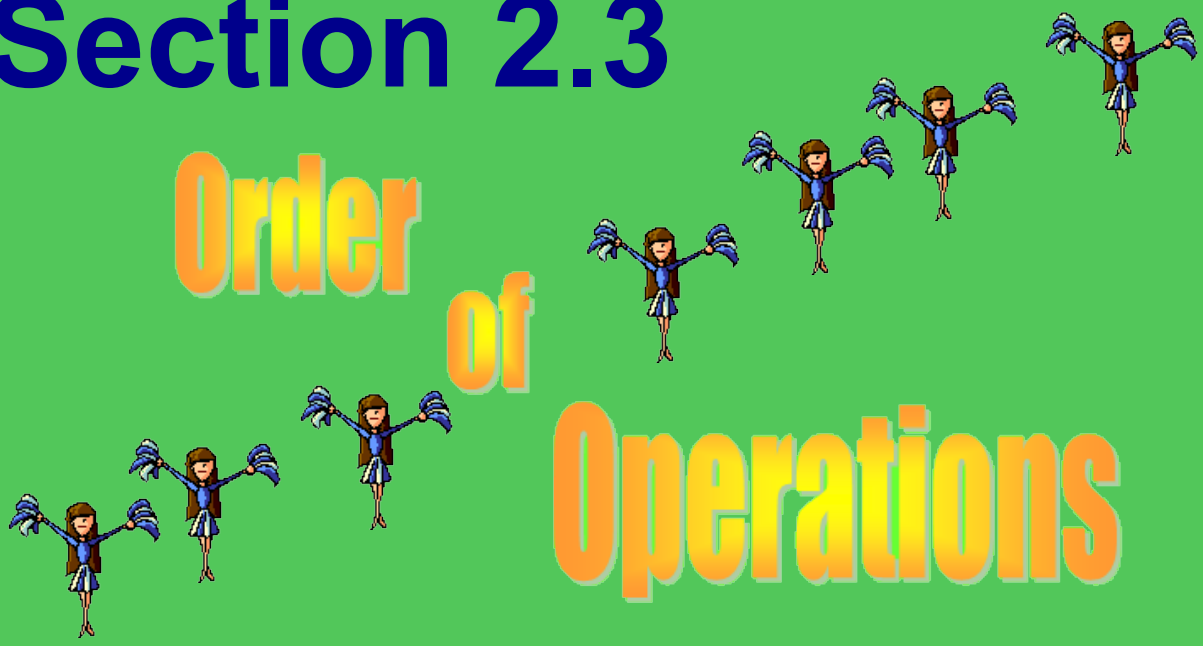
4) Write the following in standard form:

a) $(5 \times 10^4) + (9 \times 10^2) + (7 \times 10^1) + (6 \times 10^0)$

50 976

Section 2.3

Order of Operations




B
E
D
M
A
S
The key....
hee hee hee.

We already did questions like these

$$\frac{-15+3-13}{3\times 2-7^{0}}$$

Top:

-15 + 3 -13

-12 - 13

-25

Bottom:

$3 \times 2 - 7^{0}$

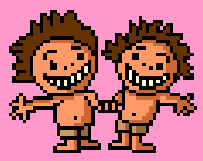
3 x 2 - 1

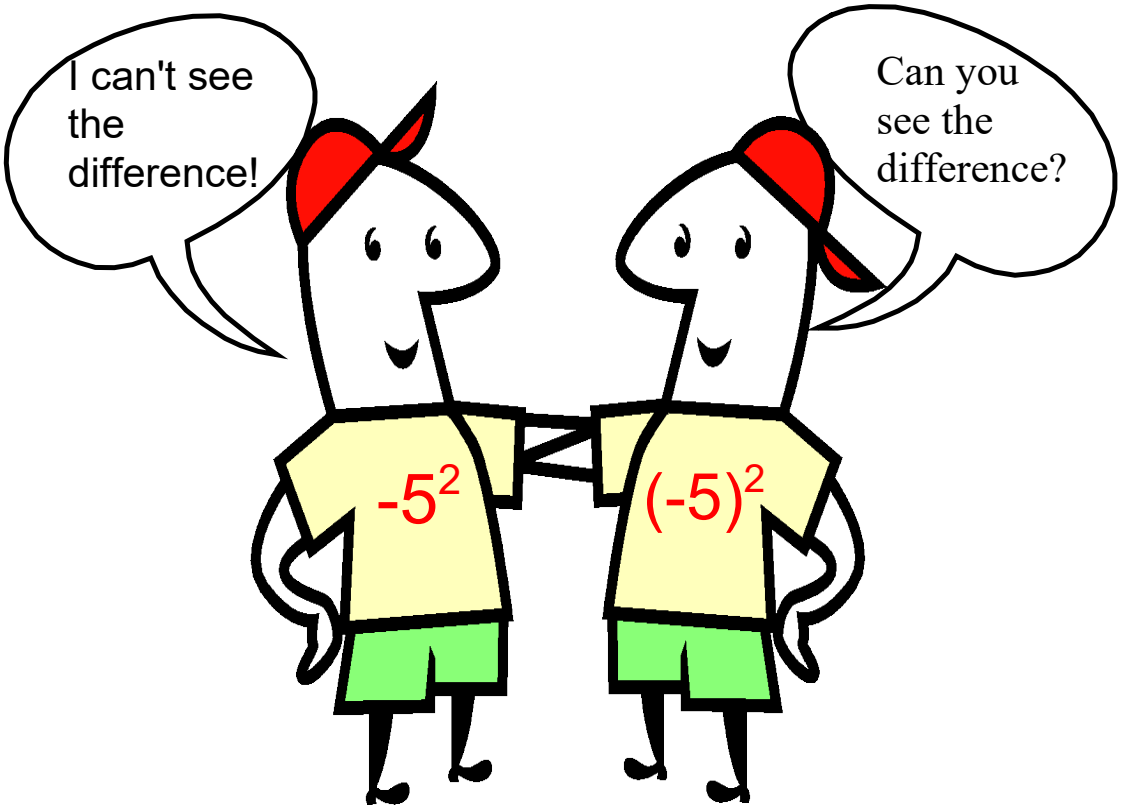
6 - 1

5

$$\frac{\text{Top}}{\text{Bottom}} = \frac{-25}{5} = -5$$

Order of Operations with Exponents





$5 - 3^3$

$5 - 27$

$= -22$

$5 - (-3)^3$

$5 - -27$

$= 32$

THERE IS A huge DIFFERENCE!

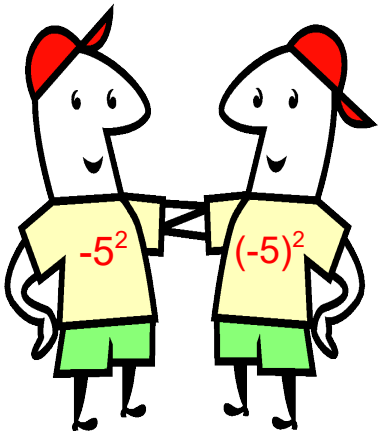
-5^2

$(-1)5^2$

$(-1)25$

-25

There is a -1 being multiplied by the 5^2.



$(-5)^2$

$(-5)(-5)$

25

Try These:

1. -4^2

$= -16$

2. $(-3)^2$

$= 9$

3. $(-2)^3$

$= -8$

BEDMAS

$$[3 + (-3)^0 - 5(3-7)^2] + 1$$

$$[3 + (-3)^0 - 5(-4)^2] + 1$$

$$[3 + 1 - 5(16)] + 1$$

$$[3 + 1 - 80] + 1$$

$$[-76] + 1$$

$$-75$$

BEDMAS

$$-5^2 + [4 + (-2)^2 - 3]^3$$

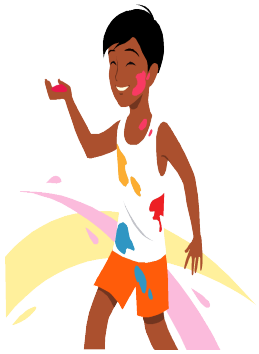
$$-5^2 + [4 + (4) - 3]^3$$

$$-5^2 + [5]^3$$

$$-25 + 125$$

$$100$$

$$[\,(-4-(-3))^2]^2 - (-3^3+2)^3$$



$$[\,(-1)^2]^2 - (-27 + 2)^3$$

$$[\,(1)]^2 - (-25\,)^3$$

$$[1] - (-15625\,)$$

$$15626$$

Lyn has a square swimming pool, 2 m deep with side length 4 m. The swimming pool is joined to a circular hot tub, 1 m deep with diameter 2 m. Lyn adds 690 g of chlorine to the pool and hot tub each week. This expression represents how much chlorine is present per 2 m^3 of water:

$$\frac{690}{2 \times 4^2 + \pi \times 2^3}$$

The suggested concentration of chlorine is 20 g/m^3 of water. What is the concentration of chlorine in Lyn's pool and hot tub? Is it close to the suggested concentration?

$$\frac{690}{2 \times 4^2 + \pi \times 2^3}$$

Top: 690

Bottom:

$2 \times 4^2 + 3.14 \times 2^3$

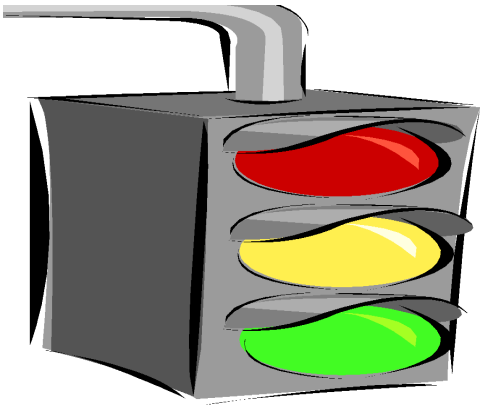
$2 \times 16 + 3.14 \times 8$

$32 + 25.12$

57.12

$$\frac{\text{Top}}{\text{Bottom}} = \frac{690}{57.12}$$

$= 12.0$



Class/Homework

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Questions : SHOW WORK

3,4,5,8,10,15, 16, 19