

Warm Up

Review From Grade 9

1) $(2 + (5+1)^3 + (-2)^7) \div [2(-1 + 4^2)]$

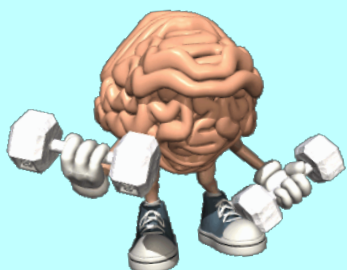
2) $\frac{(6 \times 14)}{7} + 100 \times 4 \div 5^2$

3) A taxi driver charges a flat fee of \$9.00 and \$3.00 for every kilometre travelled.

a) Write an equation that represents the scenario.

b) If you travel 18 km how much would you have to pay the taxi driver? (use your equation from part a)

b) If you have \$66.00 how far can you travel in the taxi? (use your equation from part a)



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Review From Grade 9

$$\begin{aligned}
 1) \quad & (2 + (5+1)^3 + (-2)^7) \div [2(-1 + 4^2)] \\
 & = [2 + (6)^3 + (-2)^7] \div [2(-1 + 16)] \\
 & = [2 + 216 + -128] \div [2(-1 + 16)] \\
 & \quad [2 + 216 - 128] \div [2(15)] \\
 & \quad \quad \quad \underbrace{\hspace{10em}}_{90} \quad \div \quad \underbrace{\hspace{2em}}_{30} \\
 & = 3
 \end{aligned}$$

$$2) \frac{(6 \times 14)}{7} + 100 \times 4 \div 5^2$$

$$= \frac{84}{7} + 100 \times 4 \div 5^2$$

$$= \frac{84}{7} + 100 \times 4 \div 25$$

$$= 12 + 100 \times 4 \div 25$$

$$= 12 + 400 \div 25$$

$$= 12 + 16$$

$$= 28$$

3) A taxi driver charges a flat fee of \$9.00 and \$3.00 for every kilometre travelled.

per
for each
for each
goes
with
letter
let
x is
Hot
Km

a) Write an expression that $9 + 3x$ represents the scenario.

b) If you travel 18 km how much would you have to pay the taxi driver?

(use your expression from part a)

$$\begin{aligned} 3x + 9 \\ 3(18) + 9 \\ 54 + 9 \\ \$63 \end{aligned}$$

Cost would be \$63

b) If you have \$66.00 how far can you travel in the taxi? (use your equation from part a)

$$3x + 9 = 66 - 9$$

$$\frac{3x}{3} = \frac{57}{3}$$

$$x = 19$$

Must travel 19 km to spend \$66



Can you see the difference?

$$-4^2$$

exponent is attached to the 4 not the negative sign

$$\begin{aligned} -4^2 &= -4 \times 4 \\ &= -16 \end{aligned}$$

$$(-4)^2$$

both negative sign and 4 are tied to the exponent 2

$$\begin{aligned} (-4)^2 &= (-4) \times (-4) \\ &= +16 \end{aligned}$$

Ex) $-(2)^2$
 $-(2 \times 2)$
 -4

Ex) $-(-3)^3$
 $-(-3 \times -3 \times -3)$
 $-(-27)$
 $+27$

THINK

$$(-1)^2 = +1$$

$$(-1)^3 = -1$$

$$(-1)^4 = +1$$

$$(-1)^5 = -1$$

⋮

Did you see a pattern??

$$(-1)^{10247} = -1$$

↑
odd

$$(-1)^{29584} = +1$$

↑
even

$$(-1)^{10247} = -1$$

$$(-1)^{29584} = 1$$

THINK

☺ Evaluating powers when the ^{with} base is negative...

- * If the exponent is even the answer will be positive.
- * If the exponent is odd the answer will be negative.



Perfect Squares



$$(1)^2 = 1 \times 1 = 1$$

$$(2)^2 = 2 \times 2 = 4$$

$$(3)^2 = 3 \times 3 = 9$$

$$(4)^2 = 4 \times 4 = 16$$

$$(5)^2 = 5 \times 5 = 25$$

$$(6)^2 = 6 \times 6 = 36$$

$$(7)^2 = 7 \times 7 = 49$$

$$(8)^2 = 8 \times 8 = 64$$

$$(9)^2 = 9 \times 9 = 81$$

$$(10)^2 = 10 \times 10 = 100$$

$$(11)^2 = 11 \times 11 = 121$$

$$(12)^2 = 12 \times 12 = 144$$

$$(13)^2 = 13 \times 13 = 169$$

$$(14)^2 = 14 \times 14 = 196$$

$$(15)^2 = 15 \times 15 = 225$$

$$(16)^2 = 16 \times 16 = 256$$

$$(17)^2 = 17 \times 17 = 289$$

$$(18)^2 = 18 \times 18 = 324$$

$$(19)^2 = 19 \times 19 = 361$$

$$(20)^2 = 20 \times 20 = 400$$

$$(21)^2 = 21 \times 21 = 441$$

$$(22)^2 = 22 \times 22 = 484$$

$$(23)^2 = 23 \times 23 = 529$$





Perfect Cubes



$$(1)^3 = 1 \times 1 \times 1 = 1$$

$$(2)^3 = 2 \times 2 \times 2 = 8$$

$$(3)^3 = 3 \times 3 \times 3 = 27$$

$$(4)^3 = 4 \times 4 \times 4 = 64$$

$$(5)^3 = 5 \times 5 \times 5 = 125$$

$$(6)^3 = 6 \times 6 \times 6 = 216$$

$$(7)^3 = 7 \times 7 \times 7 = 343$$

$$(8)^3 = 8 \times 8 \times 8 = 512$$

$$(9)^3 = 9 \times 9 \times 9 = 729$$

$$(10)^3 = 10 \times 10 \times 10 = 1000$$

$$(11)^3 = 11 \times 11 \times 11 = 1331$$

$$(12)^3 = 12 \times 12 \times 12 = 1728$$

$$(13)^3 = 13 \times 13 \times 13 = 2197$$

$$(14)^3 = 14 \times 14 \times 14 = 2744$$

$$(15)^3 = 15 \times 15 \times 15 = 3375$$

$$(16)^3 = 16 \times 16 \times 16 = 4096$$

$$(17)^3 = 17 \times 17 \times 17 = 4913$$

$$(18)^3 = 18 \times 18 \times 18 = 5832$$

$$(19)^3 = 19 \times 19 \times 19 = 6859$$

$$(20)^3 = 20 \times 20 \times 20 = 8000$$

$$(21)^3 = 21 \times 21 \times 21 = 9261$$

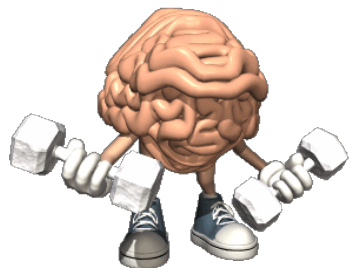
$$(22)^3 = 22 \times 22 \times 22 = 10648$$

$$(23)^3 = 23 \times 23 \times 23 = 12167$$

$$(24)^3 = 24 \times 24 \times 24 = 13824$$

$$(25)^3 = 25 \times 25 \times 25 = 15625$$





Warm Up

a) $(-3)^5 = (-3)(-3)(-3)(-3)(-3)$
 $= -243$

b) $(-7)^6 = +117\,649$

c) $\sqrt{\frac{64}{81}} = \frac{\sqrt{64}}{\sqrt{81}} = \frac{8}{9}$

d) $\sqrt{-49}$ *imaginary number*
 \Rightarrow *Cannot take $\sqrt{\quad}$ of negatives*

e) $\sqrt[3]{1728}$
 $= \sqrt{12 \times 12 \times 12}$
 $= 12$

f) $\sqrt[4]{625} = \sqrt{5 \times 5 \times 5 \times 5}$
 $= 5$

Opposites

Up	Down
Left	Right
Black	White
Yes	No

Opposites

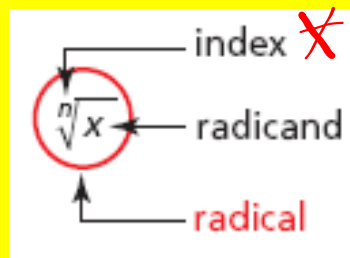
+	-
X	÷
$7^2 = 49$	$\sqrt{7^2} = \sqrt{49} = 7$
2^3	$\sqrt[3]{2^3} = \sqrt[3]{8} = 2$
3^4	$\sqrt[4]{3^4} = \sqrt[4]{81} = 3$



What do you know???

$$\sqrt{64} = \sqrt{8 \times 8} = 8$$

$$\sqrt[3]{27} = \sqrt[3]{\underline{3} \times \underline{3} \times \underline{3}} = 3$$



$$\sqrt[4]{64}$$



What do you know???

$$\sqrt[2]{\frac{4}{16}}$$

$$= \frac{\sqrt{4}}{\sqrt{16}} = \frac{2}{4} \stackrel{\text{Reduce}}{=} \frac{1}{2}$$

$$\sqrt[3]{\frac{8}{27}}$$

$$= \frac{\sqrt[3]{8}}{\sqrt[3]{27}} = \frac{2}{3}$$

Must show this step

