

[44 minute lesson]

Czech Republic Public Release Lesson 1 Lesson Graph [8th grade]



13 1/2 minutes

Optional Private or Public Class Work: Grading Two Students

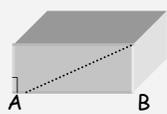
Marcela is graded after she solves the following problem at the board: *A rhombus has two diagonals. One diagonal is 12 cm and the other is 7 cm. Find the perimeter.* The other students can watch or solve the problem at their seats.

S: The diagonal divides the rhombus into 2 halves. Using the Pythagorean formula, we can find out the length of each side.

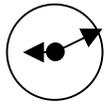


$$\begin{aligned} \mu &= 12 \text{ cm} & a^2 &= (\mu/2)^2 + (\mu^1/2)^2 & a &= \sqrt{36+12.25} & \sigma &= a \cdot 4 \\ \mu^1 &= 7 \text{ cm} & a &= \sqrt{(\mu/2)^2 + (\mu^1/2)^2} & a &= 48.25 & \sigma &= 6.9 \cdot 4 \\ \sigma &=? & a &= \sqrt{(12/2)^2 + (7/2)^2} & a &= 6.9 \text{ cm} & \sigma &= \underline{27.6 \text{ cm}} \\ & & a &= \sqrt{6^2 + 3.5^2} & & & & \end{aligned}$$

She gets a B because she needed help to draw the rhombus. Dan is given an A after he solves the problem: *Calculate the length of the body diagonal if the measurements of a parallelepiped are 3.2dm, 46cm, and 5.3dm.*



$$\begin{aligned} C &= 3.2 \text{ dm} & D & & G & & x &= \sqrt{a^2 + b^2} & x &= \sqrt{3140} & y &= \sqrt{x^2 + b^2} & y &= \sqrt{5945} \\ B &= 46 \text{ cm} & & & & & b &= \sqrt{32^2 + 46^2} & x &= 56 \text{ cm} & y &= \sqrt{56^2 + 53^2} & y &= \underline{77.1 \text{ cm}} \text{ or} \\ C &= 5.4 \text{ dm} & A & & a & & & x &= \sqrt{1024 + 2016} & \text{"wall diagonal"} & y &= \sqrt{3136 + 2809} & & \underline{7.71 \text{ dm}} \\ & & \text{Body diagonal} &=? & & & & & & & & & & \end{aligned}$$



6 1/2 minutes

Private Class Work: Solving a Review Problem

The legs of an easel are 2.5 meters. Calculate the height of the easel if the legs stand 1.5 meters apart.

One student solves the problem behind the blackboard. After 6 minutes, it is turned around and shown publicly.

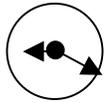


$$\begin{aligned} c &= 2.5 \text{ m} & v^2 &= c^2 - (a/2)^2 & v &= \sqrt{6.25 - 0.5625} \\ v &=? & v &= \sqrt{c^2 - (a/2)^2} & v &= \underline{2.38 \text{ m}} \\ a &= 1.5 \text{ m} & v &= \sqrt{2.5^2 - (1.5/2)^2} & & & & \end{aligned}$$

1 1/2 minutes

Public Class Work: Going over Homework

1) $4+3 \cdot 2^2 =$ 2) $4+(3 \cdot 2)^2 =$ 3) $(4+3) \cdot 2^2 =$ 4) $(4+3 \cdot 2)^2 =$ 5) $4-3 \cdot 2^2 =$ 6) $4-(3 \cdot 2)^2 =$ 7) $(4-3) \cdot 2^2 =$ 8) $(4-3 \cdot 2)^2 =$
 $4+3 \cdot 4 = 16$ $4+6^2 = 40$ $7 \cdot 2^2 = 28$ 100 $4-12 = -8$ $4-6^2 = -32$ $1 \cdot 4 = 4$ $(4-6)^2 = 4$



5 1/2 minutes

Optional Private or Public Class Work: Working on Textbook Problems

Students complete problems at the board, while their classmates work at their seats.

1) $(5+3) \div 4^2 =$ 2) $5-(3 \div \sqrt{4}) =$ 3) $5+(3 \div 4)^2 =$ 4) $((5-3) \div \sqrt{4})^2 =$
 $8 \div 16 =$ $5-(3 \div 2) =$ $5+(3/4)^2 =$ $(2 \div 2)^2 =$
 $0.5 \text{ or } 1/2$ $5-1.5 = 3.5$ $5+9/16 = 89/16$ $1^2 = 1$

2 minutes

Private Class Work: Solving Textbook Problems at their Seats

Fill in the blank with the correct symbol. 1) 2^2+2^2 $2 \cdot 2^2$ 2) 2^3+2^3 $3 \cdot 2^2$ 3) 2^2+2^3 $3 \cdot 2^2$ 4) 2^3+2^2 $2 \cdot 2^3$



5 minutes

Public Class Work: Discussing the Seatwork and Working on More Problems from the Textbook

Seatwork problems: 1) $2^2+2^2 = 2 \cdot 2^2$ 2) $2^3+2^3 > 3 \cdot 2^2$ 3) $2^2+2^3 = 3 \cdot 2^2$ 4) $2^3+2^2 < 2 \cdot 2^3$
 $2^2+2^2=8, 2 \cdot 2^2=8$ $2^3+2^3=16, 3 \cdot 2^2=12$ $4+8=12, 3 \cdot 4=12$ $8+4=12, 2 \cdot 8=16$

Additional problems: Translate into words 1) $3+5 =$ three plus five 2) $4-(-8) =$ four minus negative eight

T: Product means what? S: Multiply T: And quotient? S: Divide

3) $(5-3)^4 =$ subtract, then raise to the fourth power 4) $5^4-3^4 =$ calculate the fourth powers, then subtract
5) $5(12+3) =$ add, then multiply by five 6) $\sqrt{11+7} =$ square root of the sum
7) $\sqrt{11}+\sqrt{7} =$ sum of the square roots

3 minutes

Private Class Work: Solving Textbook Problems at their Seats

Translate into numbers and calculate.

- 1) The difference between 15 and 9 2) The product of 15 and 9
3) How many 8s are in 64 4) The sum of 17 and 12 5) The sum of 15 and the product of 2 and 9
6) The sum of 15 and 9 multiplied by 4 7) Two times the sum of 15 and 9
8) The product of 15 and 2 added to the product of 9 and 2

2 minutes

Public Class Work: Discussing the Seatwork

1) $15-9=6$ 2) $15 \cdot 9=135$ 3) $64 \div 8=8$ 4) $17+12=29$ 5) $15+(2 \cdot 9)=33$ 6) $4(15+9)=96$ 7) $2(15+9)=48$ 8) $(15 \cdot 2) \div (9 \cdot 2)=48$



5 minutes

Optional Private or Public Class Work: Solving Textbook Problems at the Board

Two students solve each of the first three problems at the board; others work at their seats. Translate into numbers and calculate

1) The product of 4 and 11 increased by the difference of 100 and 37. $(4 \cdot 11) + (100 - 37) = 44 + 63 = 107$
2) From the sum of 2.4 and 5.6 subtract the quotient of 42 and 6. $2.4 + 5.6 - 42 \div 6 = 8 - 7 = 1$
3) To the difference of 3 and 7 add the quotient of 5 and 8. $3 - 7 + 5 \div 8 = -4 + 5/8 = -32/8 + 5/8 = -27/8$

Those who didn't complete the last two problems at their seats are assigned them for homework.

4) From the product of 9 and 17 subtract three times the sum of 28 and 19
5) To the quotient of 12 and 6 add their product