MATH WITH AMAR / NUMBERVERSE

Five free math missions

Try before reading the solutions. No timer. Explain a method that makes sense to you.

A02 / ARITHMETIC / GRADES 4-6

The portal machine

A portal starts with 18 energy units. First subtract 6; then divide the result by 3. How many energy units reach the portal? Write one expression that preserves that order.

Hint, if needed: The division acts on the result of the subtraction, so use parentheses.



Sketch your idea or show your steps. Extra paper is welcome.

F05 / FRACTIONS / GRADES 5-7

Which shield is stronger?

Shield A is charged to 5/8 of its capacity. Shield B is charged to 7/12 of its identical capacity. Which shield has more charge, and by what fraction of one full capacity?

Hint, if needed: Compare using a common denominator, then find the difference.



Sketch your idea or show your steps. Extra paper is welcome.

P01 / PERCENTAGES / GRADES 6-8

The changing price tag

A fictional $80 backpack is discounted by 25%. An 8% tax is then added to the discounted price. What is the final cost?

Hint, if needed: The tax applies to the discounted price, not the original $80.

Sketch your idea or show your steps. Extra paper is welcome.

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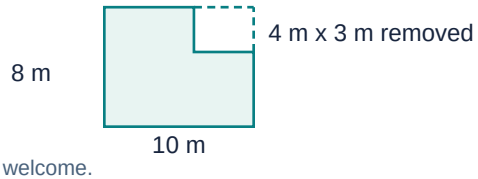
G02 / GEOMETRY / GRADES 5-7

The missing garden corner

A rectangular garden is 10 m wide and 8 m high. A 4 m by 3 m rectangular corner is removed from its upper-right corner. What area remains? The diagram is a guide; use the given dimensions.

Hint, if needed: Find the large rectangle's area, then subtract the removed rectangle's area.



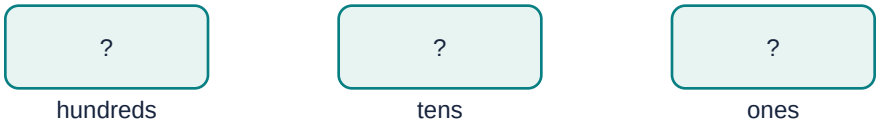
Sketch your idea or show your steps. Extra paper is welcome.

L03 / LOGIC / GRADES 5-8

The three-digit vault

A three-digit code uses three different digits from 1 to 5. The hundreds digit is one more than the tens digit. The ones digit is one more than the hundreds digit. The digit sum is 9. What is the code?

Hint, if needed: Express the other digits in terms of the tens digit, or test the few possible triples.



Sketch your idea or show your steps. Extra paper is welcome.

Worked solutions

One clear method for each mission. A different correct explanation is welcome.

A02 / The portal machine

Answer: 4 energy units; (18 - 6) / 3 = 4

1. First operation: 18 - 6 = 12 energy units.
2. Second operation: 12 / 3 = 4 energy units.
3. A correct combined expression is (18 - 6) / 3 = 4. The parentheses keep the stated order.

F05 / Which shield is stronger?

Answer: Shield A; the difference is 1/24 of a full capacity

1. Use twenty-fourths: 5/8 = 15/24 and 7/12 = 14/24.
2. Since 15/24 is larger than 14/24, Shield A has more charge.
3. The difference is 15/24 - 14/24 = 1/24 of a full capacity.

P01 / The changing price tag

Answer: $64.80

1. The discount is 25% of $80 = $20, so the new price is $60.
2. Tax is 8% of $60 = $4.80.
3. Final cost: $60 + $4.80 = $64.80. Equivalently, 80 x 0.75 x 1.08 = 64.80.

G02 / The missing garden corner

Answer: 68 square meters

1. The original rectangle has area 10 x 8 = 80 square meters.
2. The removed corner has area 4 x 3 = 12 square meters.
3. The remaining area is 80 - 12 = 68 square meters.

L03 / The three-digit vault

Answer: 324

1. Let the tens digit be t. The hundreds digit is t + 1 and the ones digit is t + 2.
2. Their sum is (t + 1) + t + (t + 2) = 3t + 3 = 9, so t = 2.
3. The hundreds, tens and ones digits are therefore 3, 2 and 4: code 324.