Entrance to year 1 sample questions (no calculator)/*Vzorový test pro 1. ročník (kalkulačka není povolena)*

Q1.

(a) Work out $1\frac{1}{5}+\frac{5}{6}$

Vypočítej

(b) Work out $\frac{4}{7}$ x £56

Vypočítej

(c) Work out $\frac{\frac{3}{8}\div\frac{3}{4}}{2}$

Vypočítej

(d) Work out 27 x 45

Vypočítej

Q2.

(a) Write down all the factors of 24./*Uveď všechny činitele čísla 24.*

(b) Write down the first 6 prime numbers./*Uveď 6 prvních prvočísel.*

(c) Write 32.54 kg in grams./*Převeď 32,54 kg na gramy.*

Q3.

(a) Find 30% of $80/*Vypočítej 30% z 80 dolarů.*

(b) Write down the smallest number which is a multiple of 6 and 8. /*Uveď nejnižší společný násobek 6 a 8.*

(c) Write 3.5859472 correct to 2 decimal places./*Napiš číslo 3,5859472 s přesností na dvě desetinná místa.*

Q4.

The price of a dress is reduced by 20% and now costs 400 Kč . How much did the dress cost before it was reduced?
/ Šaty byly zlevněny o 20% a nyní stojí 400 Kč. Vypočti, kolik stály šaty před zlevněním.

Q5.

On a farm, the ratio of cows to sheep is 3:7. There are 210 cows on the farm, how many sheep are there?/*Na farmě jsou krávy a ovce a jejich počet je v poměru 3:7. Krav je 210, kolik je na farmě ovcí?*

Q6.

Calculate $\dfrac{2^4}{5^2}$

Vypočítej

(a) giving your answer as a fraction,/*odpověď uveď jako zlomek,*

[1]

(b) giving your answer as a decimal./*odpověď uveď jako desetinné číslo.*

Q7.

Which of the following is the longest period of time?/*Která z následujících možností označuje nejdelší časový úsek?*

A: 3002 hours	B: 125 days	C: 17.5 weeks	D: 4 months	E: $\frac{1}{3}$ of a year
A: 3002 hodin	B: 125 dní	C: 17,5 týdne	D: 4 měsíce	E: $\frac{1}{3}$ roku

Geometry

Q1.

Find the value of x in the following diagrams/*Vypočti hodnotu x na následujích obrázcích:*

A:

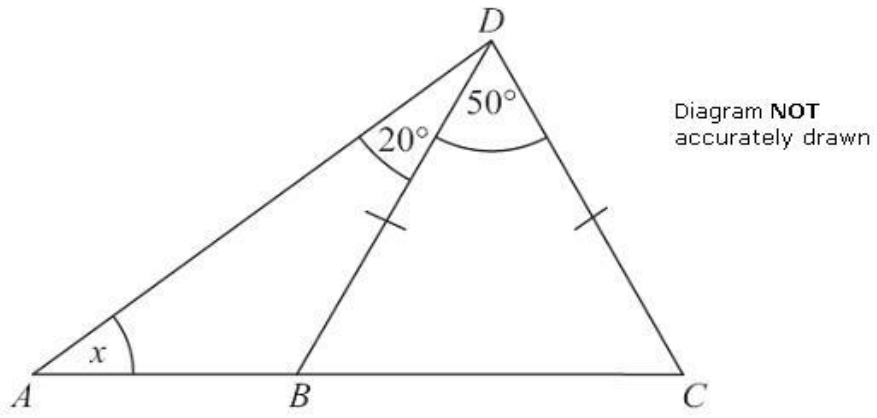
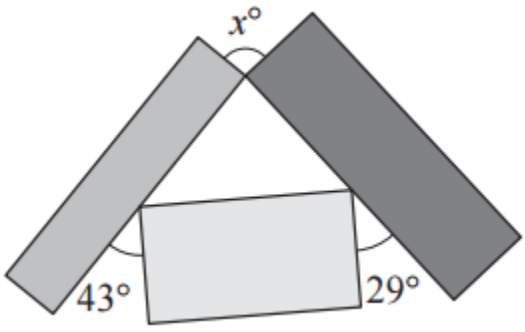


Diagram **NOT** accurately drawn

B:



Q2.

Mrs Kunal's garden is in the shape of a rectangle./*Zahrada paní Kunal má tvar čtyřúhelníku.*
Part of the garden is a patio in the shape of a triangle./*Část zahrady tvoří dlážděný dvorek ve tvaru trojúhelníku.*
The rest of the garden is grass./*Zbytek zahrady je pokryt trávou.*

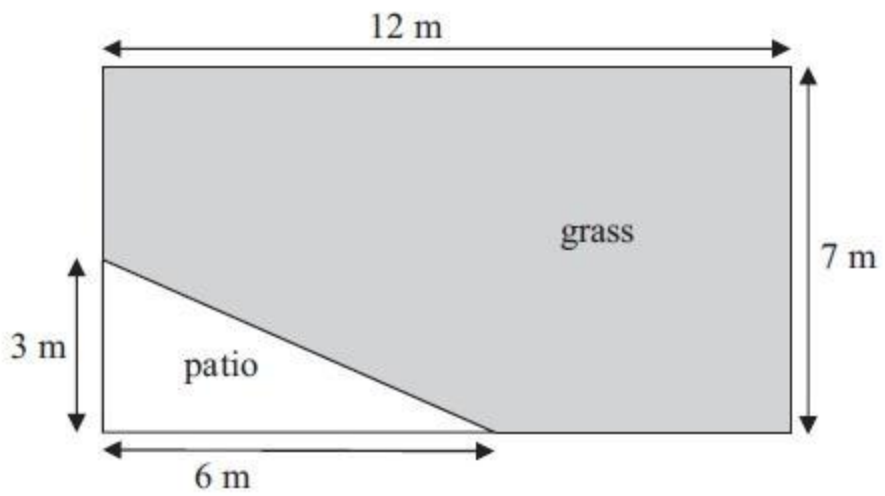


Diagram **NOT** accurately drawn

a) Find the area of the grass/*Vypočti plochu části pokryté trávou.*

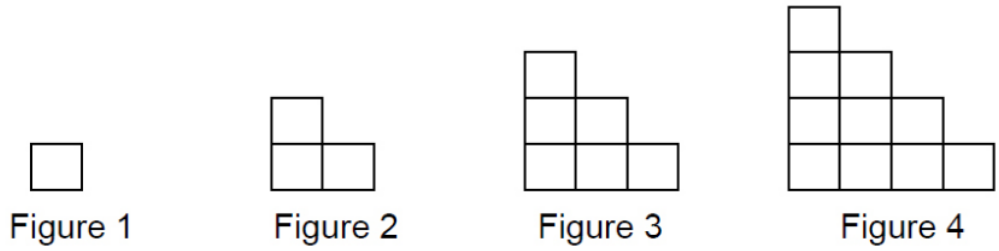
b) Mrs Kunal wants to spread fertiliser over all her grass./*Paní Kunal chce na trávu použít hnojivo.*

One box of fertiliser is enough for 32 m^2 of grass./*Jedna krabice hnojiva postačí na 32 m^2 trávy.*

How many boxes of fertiliser will she need?/*Kolik krabic hnojiva bude potřebovat?*
You must show your working./*Ukaž postup výpočtu.*

Algebra

Q1.



a) How many squares would be in Figure 5? /*Kolik čtverců by bylo na obrázku č. 5?*

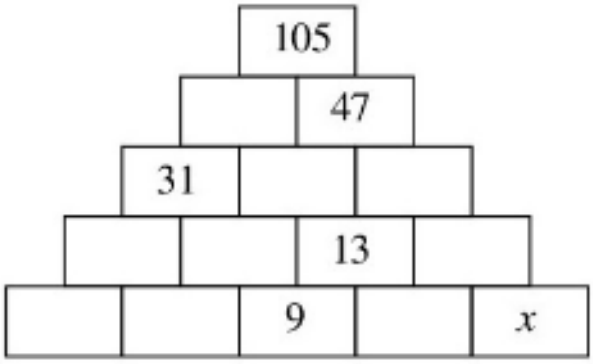
b) Which Figure has 28 squares?/*Kolikátý obrázek v řadě obsahuje 28 čtverců?*

c) In which two Figures would the total number of squares add up to 100? /*Které dva obrázky by měly celkem 100 čtverců?*

Q2.

A farmer has some chickens and rabbits in a field. Altogether there are 16 heads and 44 feet. How many chickens and how many rabbits are there? /*Farmář chová na dvoře kuřata a králíky. Dohromady mají 16 hlav a 44 nohou. Kolik je na dvoře kuřat a kolik králíků?*

Q3.

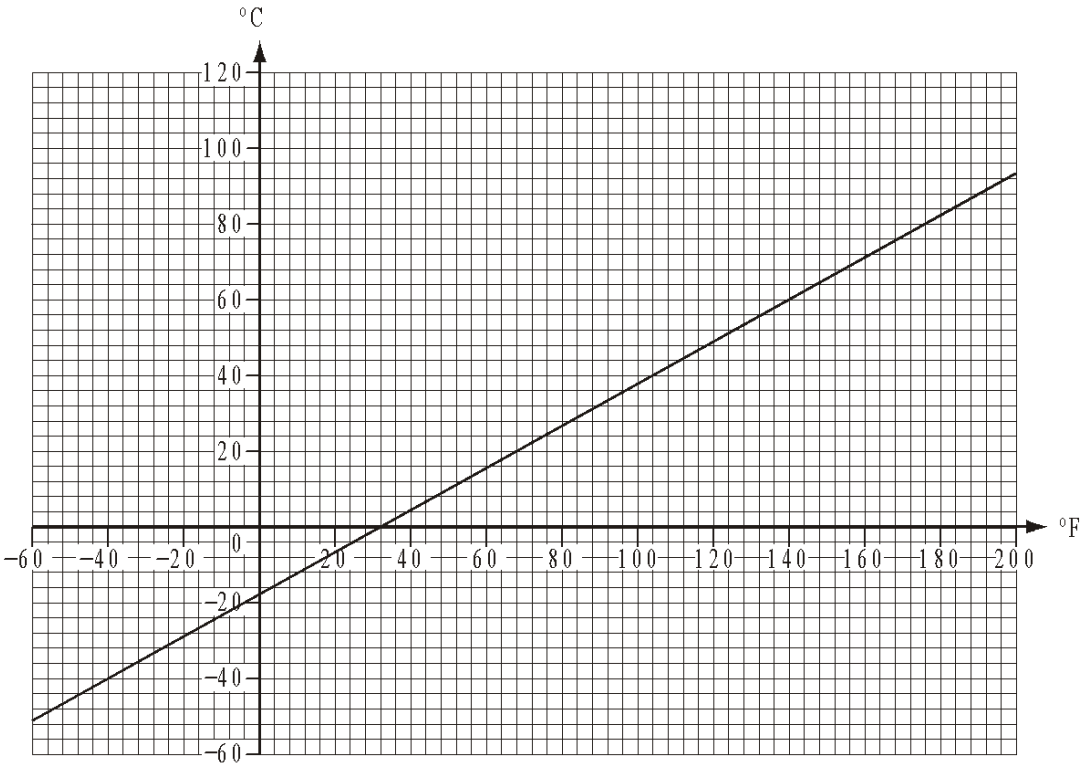


In this partly completed pyramid, each rectangle is the sum of the two rectangles below it. Find the value of x
/ V této nedokončené pyramidě představuje každý obdélník součet dvou obdélníků pod ním. Vypočítej hodnotu x.

Graphs

Q1.

The graph drawn below shows the conversion of temperatures in degrees Fahrenheit (°F) to temperatures in degrees Celsius (°C)./*Na níže uvedeném grafu je zobrazen převod teplot mezi stupni Fahrenheita (°F) a stupni Celsia (°C).*



(a) The temperature of a room is 20°C. What is the temperature in Fahrenheit?/*Teplota v pokoji je 20°C. Kolik je to stupňů Fahrenheita?*

(b) A liquid has a boiling point of 176°F. What is the temperature in Celsius?/*Tekutina se vaří při teplotě 176°F. Kolik je to stupňů Celsia?*

(c) Find *T* when *T*°C = *T*°F./*Vypočítej T když T°C = T°F.*

Data

Q1.

Matthew had a score of 72% in his mathematics test. The average mark for the mathematics and physics tests was 78%. What score did Matthew have in the physics test?

/Matthew získal v testu z matematiky 72% možných bodů. Průměrný výsledek jeho testů z matematiky a fyziky byl 78%. Kolik procent získal v testu z fyziky?

Entrance to Year 1 — Worked Solutions

Sample Mathematics Examination (No Calculator) | Vzorové řešení přijímacího testu z matematiky

Section 1: Arithmetic & Numeracy

Q1. Fractions & Multiplication

(a) Calculate $1\ ^{1}/_{5} + {}^{5}/_{6}$

$= {}^{6}/_{5} + {}^{5}/_{6} = {}^{36}/_{30} + {}^{25}/_{30} = {}^{61}/_{30} = 2\ ^{1}/_{30}$

Answer: $^{61}/_{30}$ (or $2\ ^{1}/_{30}$)

(b) Calculate $^{4}/_{7} \times 56$

$= 4 \times (56 \div 7) = 4 \times 8 = 32$

Answer: 32

(c) Work out $[\ {}^{3}/_{8} - {}^{3}/_{4}\ ] \div 2$

Numerator: $^{3}/_{8} - {}^{6}/_{8} = -\ {}^{3}/_{8}$

Divide by 2: $-\ {}^{3}/_{8} \div 2 = -\ {}^{3}/_{16}$

Answer: $-\ {}^{3}/_{16}$

(d) Work out 27×45

$27 \times 40 = 1080$

$27 \times 5 = 135$

$1080 + 135 = 1215$

Answer: 1215

Q2. Factors, Primes & Units

(a) Factors of 24: Numbers that divide 24 exactly.

Answer: 1, 2, 3, 4, 6, 8, 12, 24

(b) First 6 prime numbers: (Greater than 1, only divisible by 1 and itself)

Answer: 2, 3, 5, 7, 11, 13

(c) Convert 32.54 kg to grams: 1 kg = 1000 g → $32.54 \times 1000 = 32{,}540$ g

Answer: 32,540 g

Q3. Percentages, Multiples & Rounding

(a) Find 30% of \$80:

10% of \$80 = \$8

30% = 3 × \$8 = \$24

Answer: \$24

(b) Smallest multiple of 6 and 8 (LCM):

Multiples of 6: 6, 12, 18, **24**, 30...

Multiples of 8: 8, 16, **24**, 32...

Answer: 24

(c) Write 3.5859472 correct to 2 decimal places:

Look at the 3rd decimal digit (5): round up second digit (8 → 9).

Answer: 3.59

Q4. Reverse Percentage

Reduced by 20% → 80% of original price = 400 Kč.

10% of original price = 400 ÷ 8 = 50 Kč.

100% (Original price) = 50 × 10 = 500 Kč.

Answer: 500 Kč

Q5. Ratio & Proportion

Ratio Cows : Sheep = 3 : 7.

3 parts = 210 cows → 1 part = 210 ÷ 3 = 70.

7 parts (Sheep) = 7 × 70 = 490.

Answer: 490 sheep

Section 1: Arithmetic & Numeracy (Continued)

Q6. Powers & Decimal Conversion

Calculate $2^4 / 5^2 = 16 / 25$.

(a) As a fraction:

Answer: $^{16}/_{25}$

(b) As a decimal:

Multiply numerator and denominator by 4 to get hundredths:

$(16 \times 4) / (25 \times 4) = {}^{64}/_{100} = 0.64$

Answer: 0.64

Q7. Time Comparison

Convert all options into days to compare:

- **A: 3002 hours** = 3002 ÷ 24 = **125.083 days**
- **B: 125 days** = 125 days
- **C: 17.5 weeks** = 17.5 × 7 = 122.5 days
- **D: 4 months** ≈ 4 × 30.4 = 121.6 days
- **E: $^1/_3$ of a year** = 365.25 ÷ 3 = 121.75 days

Comparing all values: 125.083 days (Option A) is the longest duration.

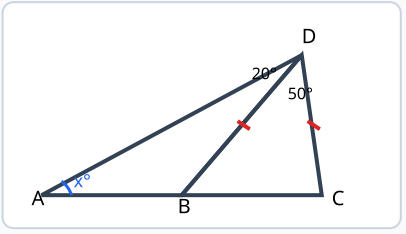
Answer: A (3002 hours)

Section 2: Geometry

Q1 (A). Angle Calculation in Triangles

Step-by-step proof:

1. In △BCD, sides BD = CD (marked isosceles). Therefore, base angles are equal: ∠DBC = ∠DCB.
2. The top angle of △BCD is 50°. Thus, ∠DBC + ∠DCB = 180° − 50° = 130°.
3. ∠DBC = 130° ÷ 2 = 65°.
4. For △ABD, the exterior angle at B is ∠DBC = 65°.
5. An exterior angle of a triangle equals the sum of two opposite interior angles: ∠DBC = x + 20°.
6. 65° = x + 20° ⇒ x = 65° − 20° = 45°.

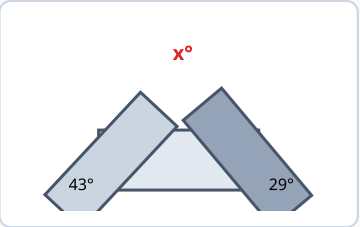


Answer: x = 45°

Q1 (B). Angles in Intersecting Rectangles

Step-by-step derivation:

1. Consider the inner triangle formed by the bottom rectangle and the two inclined side rectangles.
2. Since rectangles have right angles (90°):
3. Left interior triangle angle = 180° − 90° − 43° = 47°.
4. Right interior triangle angle = 180° − 90° − 29° = 61°.
5. Top interior triangle angle = 180° − (47° + 61°) = 180° − 108° = 72°.
6. The angle x° and this top angle are vertically opposite / form supplementary angles at the intersection point: x = 180° − 72° = 108°.



Answer: x = 108°

Q2. Garden & Patio Area Calculation

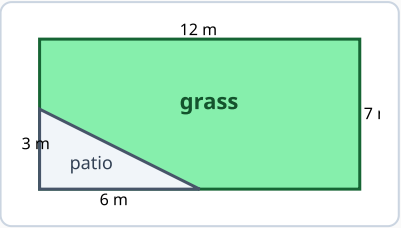
(a) Find the area of the grass:

• Total area of garden (Rectangle) = 12 m × 7 m = **84 m²**.

• Area of patio (Right-angled triangle) = $^1/_2$ × 6 m × 3 m = **9 m²**.

• Area of grass = Total Area − Patio Area = 84 m² − 9 m² = **75 m²**.

Answer (a): 75 m²



(b) Boxes of fertiliser needed:

• Total grass area = 75 m² | Coverage per box = 32 m².

• Boxes required = 75 ÷ 32 = 2.34 boxes → Round UP to whole boxes.

Answer (b): 3 boxes

Section 3: Algebra

Algebra Q1. Sequence Patterns

Pattern sequence of squares: 1, 4, 7, 10... (arithmetic rule: +3 per figure).
Formula for Fig n: $S = 3n - 2$.

(a) Figure 5: 3(5) − 2 = 15 − 2 = **13 squares**

(b) 28 squares: 3n − 2 = 28 ⇒ 3n = 30 ⇒ **Figure 10**

(c) Two figures adding to 100:
Testing terms: Fig 16 = 46, Fig 18 = 54.
Combination: Fig 16 (46 squares) + Fig 18 (54 squares) = 100.

Answer (c): Figure 16 & Figure 18

Algebra Q2. Chickens & Rabbits

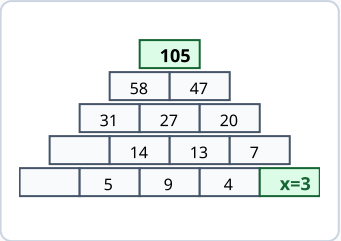
Let c = chickens (2 feet), r = rabbits (4 feet).
1) $c + r = 16 \Rightarrow c = 16 - r$
2) $2c + 4r = 44$
Substitute (1) into (2):
$2(16 - r) + 4r = 44 \Rightarrow 32 + 2r = 44 \Rightarrow 2r = 12 \Rightarrow$ **r = 6**.
$c = 16 - 6 =$ **10**.

Answer: 10 chickens, 6 rabbits

Algebra Q3. Number Pyramid Puzzle

Each block is the sum of two blocks beneath it.
Working bottom-up using algebraic variables:
- Row 5 (Bottom): [a, b, 9, c, x]
- Row 4: [a+b, b+9, 9+c = 13, c+x] $\Rightarrow 9 + c = 13 \Rightarrow$ **c = 4**.
- Row 3: [a+2b+9, b+22, 17+c+x] with left block = 31.
- Working backwards from top (105):
  Top block: 105. Right block below it = 47 $\Rightarrow$ Left block = $105 - 47 = 58$.
  Row 3 middle-right sum = 47. Row 3 middle block = $58 - 31 = 27$.
  With Row 3 middle = 27: $(b+9) + 13 = 27 \Rightarrow b + 22 = 27 \Rightarrow$ **b = 5**.
  Row 4 blocks: [12, 14, 13, 4+x].

Solving the remaining system for bottom-right block yields: **x = 3**



Section 4: Graphs & Data

Graphs Q1. Temperature Conversion (°C to °F)

Formula: $C = {}^{5}/_{9}(F - 32)$ or $F = {}^{9}/_{5}C + 32$.

(a) Room temp = 20°C: $F = ({}^{9}/_{5} \times 20) + 32 = 36 + 32 = 68$°F.

Answer (a): 68°F

(b) Boiling point = 176°F: $C = {}^{5}/_{9}(176 - 32) = {}^{5}/_{9}(144) = 80$°C.

Answer (b): 80°C

(c) Find T when T°C = T°F:
$T = {}^{9}/_{5}T + 32 \Rightarrow -{}^{4}/_{5}T = 32 \Rightarrow T = -40$.

Answer (c): T = −40

Data Q1. Test Score Averages

Mathematics score = 72%.
Average of Math and Physics = 78%.

Sum of both scores = 78% × 2 = 156%.

Physics score = 156% − 72% = 84%.

Answer: 84%