

Y5 Selective SAMPLE Mathematics Questions

Fraction and Decimals

In the recently concluded three-way race for mayor, Alfred received 13 more votes than Glenda and Glenda received 14 fewer votes than Shane.

If the average (arithmetic mean) number of votes per candidate was 33 000, how many votes did Alfred get?

- A. 27 000 votes
- B. 30 000 votes
- C. 31 500 votes
- D. 33 000 votes
- E. 36 000 votes

ANS: E

Given:

$$A = \frac{1}{3}G + G$$

$$G = S - \frac{1}{4}S$$

$$\text{Average} = 33\,000$$

Solution:

$$A = \frac{4}{3}G$$

$$G = \frac{3}{4}A$$

$$G = \frac{3}{4}S$$

$$S = \frac{4}{3}G$$

$$\frac{4}{3} \left(\frac{3}{4}\right) A = A$$

$$A + G + S / 3 = 33\,000$$

$$A + \frac{3}{4}A + A / 3 = 33\,000$$

$$2\frac{3}{4}A = 99\,000$$

$$A = \mathbf{36\,000\ votes}$$

Unit Conversion

A frosting recipe only calls for three ingredients – butter, sugar, and milk.
The recipe needs twice as much milk as sugar and three times as much sugar as butter.

How many grams of sugar is needed to make 312 kilograms of frosting?

- A. 350 grams
- B. 700 grams
- C. 1 050 grams
- D. 1 400 grams
- E. 2 100 grams

ANS: C

Given:

$2S = M$ ← twice as much milk as sugar

$3B = S$ ← three times as much sugar as butter.

$3\frac{1}{2}$ Frosting

Solution:

$3\frac{1}{2}$ kg x 1000 g / 1 kg = 3500 grams

$S + M + B = 3500$

$S + 2S + \frac{1}{3}S = 3500$

$(\frac{10}{3})S = 3500$

$S = \mathbf{1050 \text{ grams}}$

Money Problems

Ten percent of the amount of money Joey has is equal to 25 percent of the amount of money Peter has.

The amount of money Joey has is what percent of the amount of money Peter has?

- A. 40 percent
- B. 50 percent
- C. 140 percent
- D. 150 percent
- E. 250 percent

ANS: E

Given:

$$10\% J = 25\% P$$

Solution:

$$0.1J = 0.25P$$

$$J = 2.5P$$

$(J/P)100 = \text{Percentage}$

$(2.5P/P) 100 = \text{Percentage} \leftarrow \text{Cancel out } P$

Percentage = **250%**



Time, Date, and Direction

Blossom, Buttercup, and Bubbles working together at their respective constant rates, can finish working on the project in 40 minutes. Blossom and Bubbles, working together at their respective constant rates, can finish working on the same project in 50 minutes.

If Buttercup, working alone at a constant rate, started working on the same project at exactly 9:00 AM, at what time will she finish?

- A. 11:20 AM
- B. 11:30 AM
- C. 11:50 AM
- D. 12:20 PM
- E. 12:40 PM

ANS: D

Given:

All Together = 40 mins

Blossom and bubbles = 50 mins

Solution:

Work problem formula

$$1/T = 1/t_1 + 1/t_2$$

Let T = time taken if both do the work together

t₁ = time taken by 1st person

t₂ time taken by 2nd person

$$1/40 = 1/50 + 1/B$$

$$1/200 = 1/B$$

B = 200 mins or 3 hours and 20 mins

9:00AM + 3 hours and 20 mins = **12:20 PM**

Speed, Distance, and Time

Han Solo's amazing Millennium Falcon uses 37 of a litre of hyperdrive fuel for each light-year it travels.

How many light-years can the Millennium Falcon travel with a full 300-litre hyperdrive fuel tank?

- A. 128 light-years D. 540 light-years
B. 210 light-years E. 700 light-years
C. 300 light-years

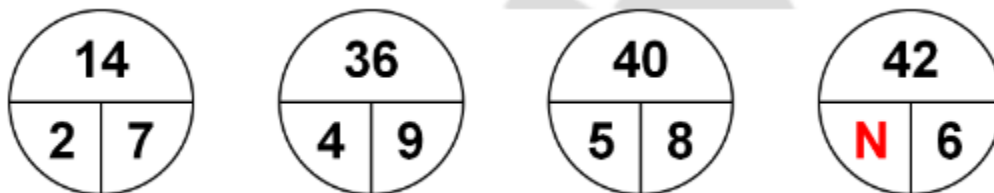
ANS: E

Solution:

If 37 litres of fuel cover 1 lightyear, then 7 lightyears will need $37 \times 7 = 259$ litres of hyperdrive fuel. The ratio of the number of litres of fuel to the number of light-years travelled is 37 : 7. Therefore, 300 litres can cover up to $300 \div 37 \approx 8.1$ light-years.

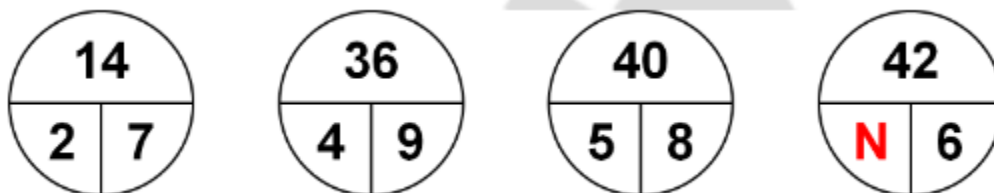
Numbers, Patterns, and Sequences

The numbers in the four circles below follow the same pattern. What number is N?



- A. 7 D. 12
B. 8 E. 16
C. 9

ANS: A
GIVEN



Solution:

Pattern is sum of the two digits below = digit above

$$N \times 6 = 42$$

$$N = 42/6 \rightarrow N=7$$

Ratios and Proportion

The rectangular courtyard in Elsa's castle has an area of 480 square metres.
The ratio of the courtyard's length to its width is 5:6.
What is the perimeter of the courtyard in Elsa's castle?

- A. 36 metres
- B. 44 metres
- C. 72 metres
- D. 88 metres
- E. 96 metres

ANS: D

Given:

$$A = 480 \text{ m}^2$$

$$L:W = 5:6$$

Solution:

Let X = ratio multiplier

$$A = LW$$

$$480 = 5X(6X)$$

$$30X^2 = 480$$

$$X^2 = 16$$

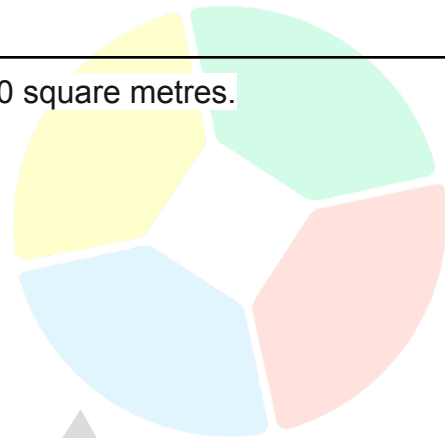
$$X = 4$$

$$P = 2(5X + 6X)$$

$$P = 2(5(4) + 6(4))$$

$$P = 2(44)$$

$$P = \mathbf{88 \text{ meters}}$$



Perimeter and Area

The area on a right-angled triangle is 32 square centimetres. If one of the legs of the triangle measures 8 centimetres, what is the length of the other leg?

- A. 4 centimetres
- B. 6 centimetres
- C. 8 centimetres
- D. 12 centimetres
- E. 16 centimetres

ANS: C

Given:

$$A = 32 \text{ cm}^2$$

$$B = 8 \text{ cm}$$

Solution:

$$A = \frac{1}{2} BH$$

$$32 = \frac{1}{2} (8)(H)$$

$$H = 8 \text{ cm}$$

Line of Symmetry, Grid, Folding, and Nets

Jack and Jill were using the grid below to send out a coded message

5	L	P	G	V	U
4	B	T	Y	O	Z
3	N	J	I	D	R
2	F	E	Q	M	H
1	A	W	K	C	S
	1	2	3	4	5

For example, the letter B can be written as (1,4) and the letter C can be written as (4,1).
If Jack sent out the coded message (1,3)(3,3)(3,5)(5,2)(2,4) to Jill, what message did he send?

- A. KNIFE
- B. NIGHT
- C. NORTH
- D. SIGHT
- E. SOUTH

ANS: B

Given

5	L	P	G	V	U
4	B	T	Y	O	Z
3	N	J	I	D	R
2	F	E	Q	M	H
1	A	W	K	C	S
	1	2	3	4	5

Solution:

$$B = (1,4)$$

$$C = (4,1)$$

Let (X,Y)

X = Horizontal

Y = Vertical

$$(1,3) = N$$

$$(3,3) = I$$

$$(3,5) = G$$

$$(5,2) = H$$

$$(2,4) = T$$

Therefore the answer is **NIGHT**



Data and Statistics

Gandalf needs to raise 300 golds in 100 days. He had already raised 200 golds in the first 60 days. What is the average (arithmetic mean) number of golds per day that Gandalf needs to raise for the last 40 days to meet his goal?

- A. 2.5 golds per day
- B. 3 golds per day
- C. 5 golds per day
- D. 6 golds per day
- E. 7.5 golds per day

ANS: A

Given:

Needs 300 golds in 100 days

First 60 days = 200 golds

Solution:

$$300 - 200 = 100 \text{ golds} \leftarrow \text{needs to raise in 40 days}$$

$$100/40 = \text{Average gold per day}$$

$$\text{Average gold per day} = \mathbf{2.5 \text{ Golds per day}}$$