RIGOUR

by cdmasterworks Ltd

Numeracy for Learning, Life and Work

July National 5 Maths Calendar

#abitofmathseveryday

1 Solve the following system of equations...

$$9x + 2y = 4$$
$$4x - 5y = 43$$

2 Find the equation of the line passing through $(-2, 4)$ and $(1, -8)$

3 Evaluate...

$$10\,000^{\frac{3}{4}}$$

4 Express the following with a rational denominator and simplify if required...

$$\frac{15}{\sqrt{21}}$$

5 What are the sizes of the interior and exterior angles?

6 Factorise...

$$7n^2 - 4n - 3$$

7 An antique chair costs £300. It's value depreciates by 2·7% each year. How much is it worth after 3 years?

8 Multiply out the following brackets and simplify...

$$(5x - 2)(x^2 - 3x - 7)$$

9 Solve the equation

$8 \sin x° + 1 = 0$

for $0 \leq x \leq 360$.

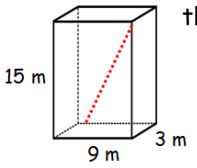
10 Calculate the standard deviation of the following data set...

3, 8, 9, 12, 15, 17, 20, 28

11 Determine the gradient and the y-intercept of the following equation...

$$3y = x + 21$$

12 For this cuboid, calculate the length of the space diagonal.



13 A function is defined as $f(t) = t^2 + 6$

For what value(s) of t does $f(t) = 70$?

14 Identify the y-intercept, the coordinates and nature of the turning point and the equation of the axis of symmetry.

$$y = (x - 5)^2 + 1$$

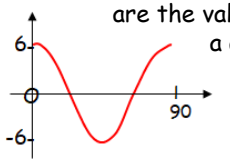
15 Solve the following inequality...

$$\frac{x}{8} + \frac{x}{4} < 6$$

16 Subtract the following fractions...

$$\frac{5}{(x+1)} - \frac{3}{(x-4)}$$

17 Shown is the graph $y = a\cos bx°$. What are the values of a and b?



18 Solve the quadratic equation

$$x^2 + 2x - 15 = 0$$

19 Calculate...

$$1\frac{1}{3} + 3\frac{1}{4} \times \frac{1}{5}$$

20 Write the following in the form...

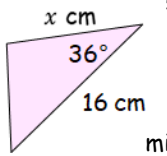
$$(x + a)^2 + b.$$

$$x^2 - 12x + 25$$

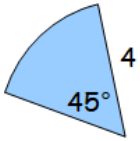
21 Vector $\mathbf{m} = \begin{pmatrix} 1 \\ 4 \\ 3 \end{pmatrix}$ and vector $\mathbf{n} = \begin{pmatrix} -5 \\ 0 \\ 6 \end{pmatrix}$.

Calculate $|2\boldsymbol{m} - 3\boldsymbol{n}|$.

22 The area of this triangle is 56·43 cm². Calculate the length of the missing side.



23 The radius of this sector is 4 m. Calculate it's area. (use π = 3·14)

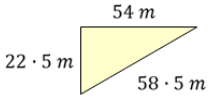


24 Change the subject of the formula to r...

$$u = \left(\frac{r}{s}\right)^2 - t$$

25 This year, Lisa paid £390 for her pet insurance. This is an increase of 30% on last year's payment. How much did Lisa pay last year?

26 Determine whether this triangle is right-angled...



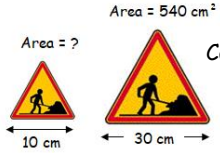
27 Simplify...

$$\frac{x^2 - 81}{x^2 + 7x - 18}$$

28 Write the following in it's simplest index form...

$$\frac{2k^{\frac{1}{4}} \times 9k^{\frac{35}{4}}}{6k}$$

29 These signs are mathematically similar. Calculate the missing area.



30 The volume of this sphere is 3·05208 mm³. Calculate it's radius...

31 Calculate the length of the missing side...