

The Challenge: Practice Questions

Last updated on 06 OCTOBER 2020

Question 1

Find the value of:

$$10 \times 2$$

Question 2

Evaluate:

$$100 + 600 \div 200$$

Question 3

Solve for x :

$$12x - 345 = 678$$

Question 4

State the remainder when

$$4x^7 + 12x^6 + 17x^5 + 22x^4 + 27x^3 + 32x^2 + 37x + 24$$

is divided by $2x + 3$.

Question 5

Determine the 4th term in the binomial expansion of:

$$\left(x^3 - \frac{1}{3x^3}\right)^6$$

Question 6

Solve for x :

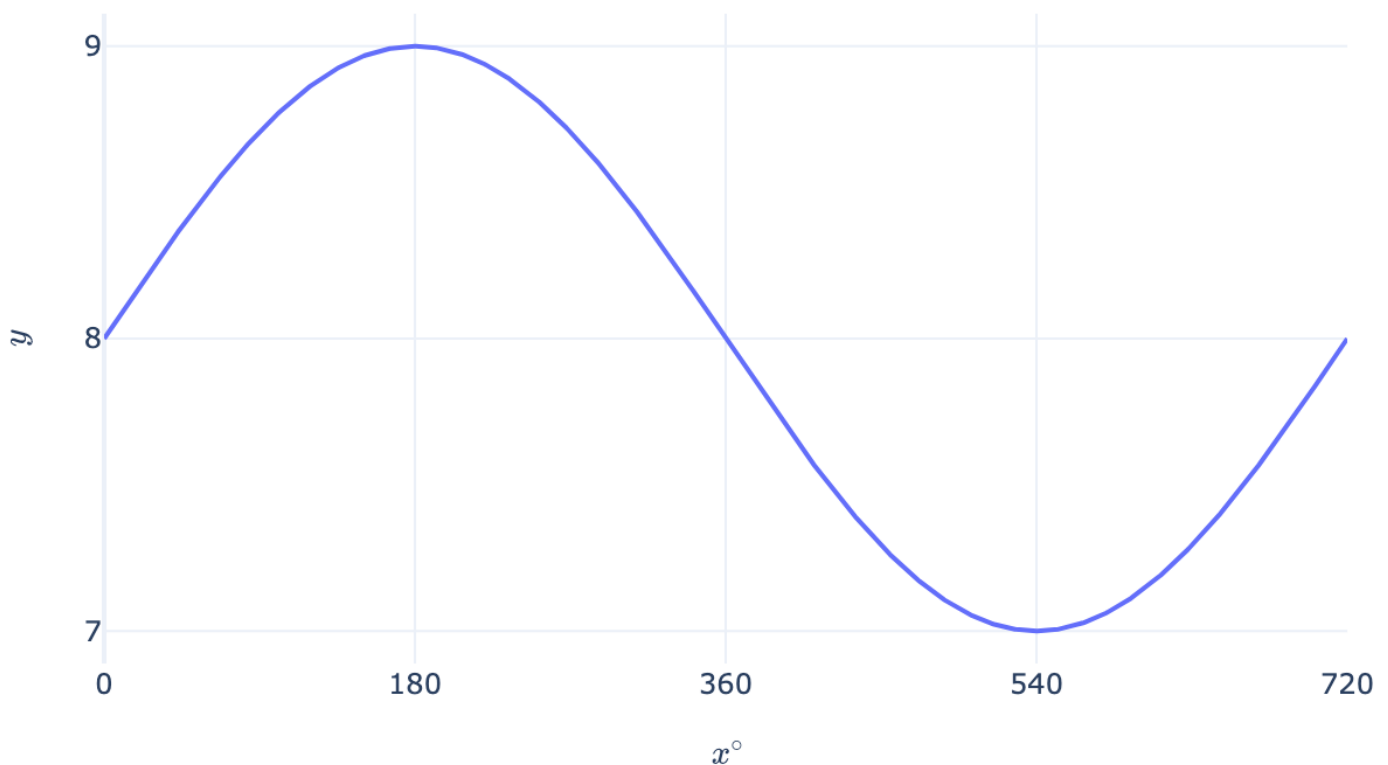
$$\sqrt{2\sqrt{3x+4}} - 5 = 0$$

Question 7

Solve for the **values** of x :

$$3 \left| \frac{-1 \times \ln(2 \times x)}{\ln(4)} + 5 \right| - 9 = 0.$$

Question 8



Determine the values of a , b and c in

$$y = a \sin \left(\frac{x}{b} \right) + c$$

given the graph of that equation as shown above. Hence state the value of $a \times b \div c$.

Question 9

Differentiate the following with respect to x :

$$\ln(2 - 3x) - \sin(5x + 6) + \cos(5x + 6)$$

Question 10

Calculate:

$$\int_{-5}^0 (8x^3 + 4x^2 + 4x) dx.$$

Question 11

Integrate the following with respect to x , leaving out the constant of integration (C) in your answer:

$$3e^{x+7} + 9 \cos(x + 3) + 2 \sec^2(x)$$

Question 12

Solve the quadratic equation with real root(s) for x :

A) $\frac{x^2}{4} + 13x + 493 = 0$

B) $x^2 + 12x + 27 = 0$

C) $\frac{x^2}{4} + 5x + 425 = 0$

Question 13

Solve for the **values** of x :

$$\frac{d}{dx} \left(\frac{x^4}{4} + \frac{11x^3}{3} + 17x^2 + 24x - 92 \right) = 0.$$

Question 14

Solve for the **values** of x in the following simultaneous equations:

$$5y = x + 46,$$

$$(x + 5)^2 + (y - 16)^2 = 65.$$

END OF SAMPLE QUESTIONS

The Challenge: Sample Questions' ANSWERS

Question 1

20

Question 2

103

Question 3

$$x = 85.25$$

Question 4

0

Question 5

$$-\frac{20}{27}$$

Question 6

$$x = 36.75$$

Question 7

$$x_1 = 8 \text{ or } x_2 = 32768$$

Question 8

0.25

Question 9

$$-5 \sin (5x + 6) - 5 \cos (5x + 6) - \frac{3}{2 - 3x}$$

Question 10

-1133.333

Question 11

$$3e^{x+7} + \frac{2 \sin (x)}{\cos (x)} + 9 \sin (x + 3) = 3e^{x+7} + 2 \tan (x) + 9 \sin (x + 3)$$

Question 12

$$x_1 = -9 \text{ and } x_2 = -3$$

Question 13

$$x_1 = -1, x_2 = -6 \text{ and } x_3 = -4$$

Question 14

$$x_1 = -1 \text{ and } x_2 = -6$$

END OF ANSWERS DOCUMENT