

Maths Question & Answers

1. Mrs. Rodger got a weekly raise of \$145. If she gets paid every other week, write an integer describing how the raise will affect her paycheck.

Solution:

Let the 1st paycheck be x (integer).

Mrs. Rodger got a weekly raise of \$ 145.

So after completing the 1st week she will get \$ (x+145).

Similarly after completing the 2nd week she will get (x + 145) +145.

= \$ (x + 145 + 145)

= \$ (x + 290)

So in this way end of every week her salary will increase by \$ 145.

2. The value of $x + x(x^x)$ when x = 2 is:

(a) 10, (b) 16, (c) 18, (d) 36, (e) 64



Solution:

 $\mathbf{x} + \mathbf{x}(\mathbf{x}^{x})$

Put the value of x = 2 in the above expression we get,

 $2 + 2(2^2)$

 $= 2 + 2(2 \times 2)$

= 2 + 2(4)

= 2 + 8

= 10

Answer: (a)

3. Mr. Jones sold two pipes at \$1.20 each. Based on the cost, his profit one was 20% and his loss on the other was 20%. On the sale of the pipes, he:

(a) broke even, (b) lost 4 cents, (c) gained 4 cents, (d) lost 10 cents,(e) gained 10 cents



20 % profit on \$ 1.20 = \$ 20/100 × 1.20 = \$ 0.20 × 1.20 = \$ 0.24 Similarly, 20 % loss on \$ 1.20 = \$ 20/100 × 1.20 = \$ 0.20 × 1.20

= \$ 0.24

Therefore, in one pipe his profit is \$ 0.24 and in the other pipe his loss is \$ 0.24.

Since both profit and loss amount is same so, it's broke even.

Answer: (a)

4. The distance light travels in one year is approximately 5,870,000,000,000 miles. The distance light travels in 100 years is:



(a) 587×10^8 miles, (b) 587×10^{10} miles, (c) 587×10^{-10} miles, (d) 587×10^{12} miles, (e) 587×10^{-12} miles

Solution:

The distance of the light travels in 100 years is:

5,870,000,000,000 × 100 miles.

= 587,000,000,000,000 miles.

= 587 × 10¹² miles.

Answer: (d)

5. A man has \$ 10,000 to invest. He invests \$ 4000 at 5 % and \$ 3500 at 4 %. In order to have a yearly income of \$ 500, he must invest the remainder at:

(a) 6 % , (b) 6.1 %, (c) 6.2 %, (d) 6.3 %, (e) 6.4 %

Solution:

Income from \$ 4000 at 5 % in one year = \$ 4000 of 5 %.

= \$ 4000 × 5/100.

= \$ 4000 × 0.05.



= \$ 200.

Income from \$ 3500 at 4 % in one year = \$ 3500 of 4 %.

= \$ 3500 × 4/100.

= \$ 3500 × 0.04.

= \$ 140.

Total income from 4000 at 5 % and 3500 at 4 % = \$ 200 + \$ 140 = \$ 340.

Remaining income amount in order to have a yearly income of \$ 500 = \$ 500 - \$ 340.

= \$ 160.

Total invested amount = \$ 4000 + \$ 3500 = \$7500.

Remaining invest amount = \$ 10000 - \$ 7500 = \$ 2500.

We know that, Interest = Principal × Rate × Time

Interest = \$ 160,

Principal = \$ 2500,

Rate = r [we need to find the value of r],

Time = 1 year.

 $160 = 2500 \times r \times 1.$



160 = 2500r

160/2500 = 2500r/2500 [divide both sides by 2500]

0.064 = r

r = 0.064

Change it to a percent by moving the decimal to the right two places r = 6.4 %

Therefore, he invested the remaining amount \$ 2500 at 6.4 % in order to get \$ 500 income every year.

Answer: (e)

6. Jones covered a distance of 50 miles on his first trip. On a later trip he traveled 300 miles while going three times as fast. His new time compared with the old time was:

(a) three times as much, (b) twice as much, (c) the same, (d) half as much, (e) a third as much

Solution:

Let speed of the 1st trip x miles / hr. and speed of the 2nd trip 3x / hr.

We know that

Speed = Distance/Time.



Or, Time = Distance/Speed.

So, times taken to covered a distance of 50 miles on his first trip = 50/x hr.

And times taken to covered a distance of 300 miles on his later trip = 300/3x hr.

= 100/x hr.

So we can clearly see that his new time compared with the old time was: twice as much.

Answer: (b)

7. If $(0.2)^x = 2$ and log 2 = 0.3010, then the value of x to the nearest tenth is:

(a) -10.0, (b) -0.5, (c) -0.4, (d) -0.2, (e) 10.0

Solution:

 $(0.2)^{\times} = 2.$

Taking log on both sides



 $\log (0.2)^{x} = \log 2.$

 $x \log (0.2) = 0.3010$, [since log 2 = 0.3010].

 $x \log (^{2}/_{10}) = 0.3010.$

x [log 2 - log 10] = 0.3010.

x [log 2 - 1] = 0.3010,[since log 10=1].

x [0.3010 -1] = 0.3010, [since log 2 = 0.3010].

x[-0.699] = 0.3010.

 $\mathbf{x} = \frac{0.3010}{-0.699}$

x = -0.4306....

x = -0.4 (nearest tenth)

Answer: ©



8. If $10^{2y} = 25$, then 10^{-y} equals:

(a) $^{-1}/_{5'}$ (b) $^{1}/_{625'}$ (c) $^{1}/_{50'}$ (d) $^{1}/_{25'}$ (e) $^{1}/_{5}$

Solution:

 $10^{2y} = 25$

 $(10^{y})^{2} = 5^{2}$

 $10^{y} = 5$

 $\frac{1}{10^{9}} = \frac{1}{5}$

 $10^{-y} = \frac{1}{5}$

Answer: (e)

9. The fraction ${}^{(5x-11)}/{}^{2}_{(2x^{+}x-6)}$ was obtained by adding the two fractions ${}^{A}/{}_{(x+2)}$ and ${}^{B}/{}_{(2x-3)}$. The values of A and B must be, respectively:

(a) 5x, -11, (b) -11, 5x, (c) -1, 3, (d) 3, -1, (e) 5, -11

Solution:



$$\frac{5z-11}{zz^{2}+z^{-6}} = \frac{A}{z+z} + \frac{B}{2z-3}$$

$$\Rightarrow \frac{5z-11}{(z+2)(2z-3)} = \frac{A(2z-3)+B(z+2)}{(z+2)(2z-3)}$$

$$\Rightarrow 5z-11 = A(2z-3)+B(z+2)$$

$$\Rightarrow 5z-11 = (2A+B)z + (-3A+2B)$$
[comparing the co-efficient of x and constant term in both the sides]
$$2A + B = 5 - (3) - 3A + 2B = -11 - (11)$$

$$\Rightarrow B = 5 - 2A - (111)$$
Put the value of B = 5-2A in (11)

$$- 3A + 10 - 4A = -11$$

$$- 3A + 10 - 4A = -11$$

$$A = 3$$
Put the value of A = 3 in (111).

$$B = 5 - 2(3)$$

$$= 5 - 6$$

$$= -1$$
Therefore, A = 3, B = -1.

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Answer: (d)

10. The sum of three numbers is 98. The ratio of the first to the second is $^{2}/_{37}$, and the ratio of the second to the third is $^{5}/_{8}$. The second number is:



Solution:

Let the three numbers be x, y and z.

Sum of the numbers is 98.

x + y + z = 98.....(i)

The ratio of the first to the second is $^{2}/_{3}$.

x/y = 2/3.

 $\mathbf{x} = \frac{2}{3} \times \mathbf{y}.$

 $x = \frac{2y}{3}$.

The ratio of the second to the third is $\frac{5}{8}$.

 $^{y}/_{z} = ^{5}/_{8}$.

 $z/v = \frac{8}{5}$.



$$z = \frac{8}{5} \times y.$$

$$z = \frac{8y}{5}$$
.

Put the value of $x = \frac{2y}{3}$ and $z = \frac{8y}{5}$ in (i).

 $^{2y}/_{3} + y + ^{8y}/_{5} = 98$

 $^{49y}/_{15} = 98.$

 $49y = 98 \times 15.$

49y = 1470.

 $y = \frac{1470}{49}$.

y = 30.

Therefore, the second number is 30.

Answer: (c)