



MATHS

BOOKS - MTG IIT JEE FOUNDATION

COMPARING QUANTITIES

Illustration

1. If
$$rac{x}{5}=rac{y}{8}$$
, then find $(x+5)$: $(y+8)$.





5. What percent of 35 kg is 2.5 kg?



Γ



9. If a radio is purchased for Rs 490 and sold

for Rs 465.5. Find the loss percentage.



10. An article is purchased for Rs 450 and sold

for Rs 500. Find the gain percentage?



11. Mayank lost 20% by selling a bicycle for 1536 What percent shall he gain or lose by selling it for 2000?

12. The marked price of a set is 450. The shopkeeper given a discount of 20% What is his selling price?



13. Two successive discounts of 20% and 5%

are equivalent to a single discount of



14. (Finding Sales Tax) The cost of a pair of roller skates at a shop was Rs 450. The sales tax charged was 5%. Find the bill amount.



15. The sales price of a television, inclusive of VAT, is Rs 13500. If VAT is charged at the rate of 8% of the list price, find the list price of the television.



16. Reena goes to a shop to buy a washing machine costing 11800. The rate of G.S.T. is 18%. She tell she shopkeeper to reduce the price of the washing machine to such an extent that she has to pay 11800 inclusive of G.S.T. Find the reduction needed in the price the price of the washing machine.



17. Find the compound interest on 800 for 3

years, compounded annually at 5% per annum.

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18. Find the amount of 12000 after 2 years, compounded annually the rate of interset being 5% P.a. during the first year and 6% p.a during the second year. Also, find the compound interset.

19. Find the compound interest on Rs 31250 at

8% per annum for $2\frac{3}{4}$ years.

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20. Find the compound interest on Rs 15625 for $1\frac{1}{2}$ years at 8% per annum when compounded half-yearly.

1. 0.05 is what percent of 20

A. 25

B. 0.025

C. 0.25

D. 2.5

Answer:



2. $x imes 15 = 37.5 \,\%$ of 220. Find x.

A. 82.5

B. 8250

C. 11

D. 5.5

Answer:

3. If X is 90% of y then what percent of X is Y? 90 % b. $101\frac{1}{9}$ % c. $11\frac{1}{9}$ % d. 190 %

A. 90

B. 190

C. 101.1

D. 111.1

Answer:

4. A number exceeds 20% of itself by 40. the

number is

A. 50

B. 60

C. 80

D. 320

Answer:



5. If 90% of A = 30% of B and B = x% of A, then

the value of x

A. 900

B. 800

C. 600

D. 300

Answer:

6. 12.5% of 192 = 50% of x, then x =

A. 48

B. 96

C. 24

D. none of these

Answer:



7. One-third of 1206 is what percent of 134?

A. 3

B. 30

C. 300

D. none of these

Answer:

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8.8/40 is equivalent to

B. 0.4

C. 0.25

D. 0.08

Answer:

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9.
$$\sqrt{(3.6~\% ~ ext{of} ~ 40)}$$
 is equal to

A. 2.8

B. 1.8

C. 1.2

D. none of these

Answer:



10. If 75% of a number is added to 7, then the

result is the number itself. The number is 50 b.

60 c. 300 d. 400

A. 150

B. 200

C. 225

D. 300

Answer:

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11. If 4.6% of x is 23, find x.

A. 400

B. 200

C. 100

D. 500

Answer:



12. The income of A is 30% more than the income of B. How much percent B's income less than A's?

B. 0.25

C.
$$23\frac{1}{13}$$
 %

Answer:



13. 25% of As income is equal to 35% of Bs income. The ratio of the incomes of A and B is 5: 7 b. 7: 5 c. 13: 15 d. 15: 13

A. 4:3

B. 5:7

C. 7:5

D. 4:7

Answer:



14. Bananas are bought at 15 for a rupee and sold at the rate of 9 for a rupee. The gain percent is

A. 0.3

B. 0.6

C.
$$66\frac{2}{3}\%$$

D. $33\frac{1}{3}\%$

Answer:

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15. A retailer allows a trade discount of 20% and a cash 1 discount of $6\frac{1}{4}$ % on the market price of the products and gets a net profit of

20% on the cost. By how much above the cost, should the products be labelled for sale? 40% b. 50% c. 60% d. 70%

A. 0.4

B. 0.5

C. 0.6

D. 0.7

Answer:

16. A shopkeeper marks his goods 20% higher than the cost price and allows a discount of 5%. The percentage of his profit is

A. 0.1

B. 0.14

C. 0.15

D. 0.2

Answer:



17. By selling a vehicle for 455000, Sumant suffers 25% loss, what was his loss?

A. 115370

B. 113570

C. 113750

D. none of these

Answer:

18. If the difference between selling a shirt at a profit of 10~% and 15% is Rs.10then the cost price is

A. 110

B. 115

C. 150

D. 200

Answer:

19. By selling an article for 100, one gains 10.

Then, the gain percent is

A. 0.09

B. 0.1

C.
$$11\frac{1}{9}$$
 %

D. none of these

Answer:

20. An article is sold for Rs. 1980 at 10% profit.

What is the cost price?

A. 1782

B. 1800

C. 2178

D. none of these

Answer:

21. By selling an article for 247.50, we get a profit of $12\frac{1}{2}$ %. The cost of the article is

A. 210

- B. 220
- C.224
- D. 225

Answer:



22. What is the cost price of an article which is

sold at a loss of 25% for 150?

A. 125

 $B.\,175$

C. 200

 $\mathsf{D}.\,225$

Answer:

23. What single discount is equivalent to two

successive discounts of 25% and 5%?

A. 0.28

B. 0.27

C. 0.2875

D. 0.282

Answer:

24. By selling a watch for 1140, a man loses 5%. In order to gain 5%, the watch must be sold for

A. 1311

B. 1197

 $C.\,1254$

D. 1260

Answer:



25. There would be 10% loss if a toy is sold at Rs. 10.80 per piece. At what price should it be sold to earn a profit of 20%?

A. 12

B. 12.96

C. 14.40

D. none of these

Answer:

26. A fruit-seller had some apples he sells 40% of them and still has 420 apples. How many apples had he in all ?

A. 588 apples

B. 600 apples

C. 672 apples

D. 700 apples

Answer:
27. At what rate of interest will a sum of money amounts to 7/4 of itself in 8 years and 4 months?

A. 0.09

B. 0.08

C. 0.07

D. 0.1



28. If every side of a triangle is doubled, then increase in the area of the triangle is $100\sqrt{2}$ % (b) 200% (c) 300% (d) 400%

A. 1

B. 2

C. 3

D. 4



29. If x % ofy is equal to 1 % ofz, y % ofz is equal to 1 % ofx and z % ofx is equal to 1 % ofy, then the value of xy + yz + zx is -

A. 1

B. 2

C. 3

D. 4



30. Joseph bought a scooter for 8400 and sold it at a gain of 6%. At what price did he sell the scooter?

A. 8204

B. 8601

C. 8904

D. 8900



31. A man buys 10 articles for Rs. 8 and sells them at the rate of Rs. 1.25 per article. His profit is $19\frac{1}{2}$ % b. 20 % c. 50 % d. $56\frac{1}{4}$ %

A. 0.2

B. 0.5

C. 1.97

D. 0.56



32. 70% of the students in a school are boys and the number of girls is 504 find the number of boys in the school

A. 1176

B. 1008

C. 1208

D. 3024



33. An army of 1,45,600 loses 25% of its soldiers in an epidemic and 15% of the remaining in battle. How many soldiers are left?

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34. In an examination, 42% students failed in Hindi and 52% failed in English. If 17% failed in both the subjects, the percentage of those who passed in both the subjects, is A. 0.23

B. 0.27

C. 0.34

D. 0.4

Answer:



35. Selling price of one thing is 3/2 times of its cost price. What will be the percentage of profit?

A. 2.02

B. 0.25

C. 3.35

D. 0.5

Answer:

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Exercise Multiple Choice Question Level Ii

1. 25% of a number is more than 18% of 650 by

19. The number is

A. 380.8

B.450

C. 544

D. none of these

Answer:

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2. A man donated 5% of his income to a charitable organisation and deposited 20% of the remainder in a bank. If he now has Rs. 1919 left, what is his income?

A. 2558.50

 $B.\,2525$

C.2500

D. 2300

Answer:

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3. Last year, the ratio between the salaries of A and B was 3 : 4. But the ratios of their individual salaries between last year and this year were 4 : 5 and 2 : 3 respectively. If the sum of their present salaries is Rs. 4160, then how much is the salary of A now? Rs.1040 b. Rs.1600 c. Rs.2560 d. Rs.3120

A. 1040

B. 1600

C.2560

D. 33120

Answer:

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4. If the cost price of 21 copies of a book, are the same as the selling price of 18 copies of the book, then gain percent is

A.
$$14\frac{2}{7}$$
 %
B. $16\frac{2}{3}$ %

C.
$$33\frac{1}{3}\%$$

D. $23\frac{1}{3}\%$

Answer:



5. A merchant has 120 kg of rice. He sells a part of it at a profit of 10% and the rest at a profit of 25%. He gains 15% on the whole. Quantity of rice he sold at 25% gain is A. 30kg

B. 40kg

C. 50kg

D. 55kg

Answer:



6. Mr Raman purchase sewing machine for Rs. 8850 with G.S.T. and sold it to customer for Rs.10300 with G.S.T. The rate of G.S.T. is 18%.

Find the C.G.S.T. and S.G.S.T. paid by Mr Raman.



7. 2400 becomes 2976 in 3 years at a certain rate of simple interest. What sum of money will become 5016 in 4 years at the same rate of interest?

A. 3820

B. 3800

C. 3700

D. 3905

Answer:



8. Three radio sets were purchased by a shopkeeper at * 2275 each. He spent 225 on each for repairing. He sold one of them at a loss of 5%. At what price should the other two

be sold, so as to gain 10% on the sale of the

three sets?

A. 5870

B. 5877

C. 5878

D. 5875



9. Rahim sells apples to his customers at the cost price itself but uses a weight of 800 g instead of 1 kg weight. Find his profit %.

A. 0.25

B. 0.2

C. 0.15

D. 0.3



10. If a:b = 3:5 and a:c = 5:7, what (b-c):(b+c) equal to? A. 4:46 B. 49:4

C. 5:48

D. 48:5

Answer:

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11. The price of a house is Rs.6, 76, 000. If the price increases every year by 4%, before two years back the price of the house was

A. 6,00,000

B. 6,25,000

C. 6,50,000

D. 5,75,000

Answer:

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12. A sum of money invested at the rate of 8% p.a. for a certain period of time yields 480 as interest. If the period of investment were 3 years more, then the interest would have been 1200. Find the sum of money.

A. 2000

B. 3050

C. 3000

D. 2050



13. A publisher allowed successive discounts of 20%, 5% and $2\frac{1}{2}$ % on books to a purchaser. If the marked price of books purchased was 75,000, then find the net selling price.

A. 55570

B. 55555

C. 55510

D. 55575

Answer:



14. The marked price of a cycle is 20% more than its cost price. If the shopkeeper allows a 10% discount on the cycle, then find his gain percent.

A. 0.08

B. 0.07

D. 0.06

Answer:

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Exercise Match The Following

1. Match the quantities given in List-I to the

respective ratios given in List-II.

	List-I		List-II
(P)	36 to 64	(1)	2:5
(Q)	40 paise to ₹ 3	(2)	9:16
(R)	24 minutes to an hour	(3)	1:16
(S)	125 ml to 2 litres	(4)	2:15

A. P-2, Q-4, R-1, S-3

B. P-2,0-1, R-4, S-3

C. P-1, Q-2, R-3, S-4

D. P-1, Q-3, R-2, S-4

Answer:

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Exercise Assertion Reason Type

 Assertion : 35% = 35 per hundredths = 35/100

Reason : Percent means per hundred or for very hundred

A. If both assertion and reason are true

and reason is the correct explanation of

assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion. C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer:

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2. Assertion : 0.5% of a is $3 \Rightarrow \frac{0.5}{100} = 3a$ Reason : p% of $x = \frac{p}{100} \times x$, where x=number and p = required percent. A. If both assertion and reason are true

and reason is the correct explanation of assertion.

- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false.
- D. If assertion is false but reason is true.



3. Assertion : Rekha bought a saree for 1240 and sold it for 1147. Her loss is 93. Reason : If the selling price of an article is less than the cost price, then the difference between the cost price and the selling price is called profit.

A. If both assertion and reason are true and reason is the correct explanation of assertion. B. If both assertion and reason are true but

reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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4. Assertion : If marked price of an article is 1300 and discount is 10%. The selling price of the article is 1180.

Reason : The selling price of an article can be calculated by the formula S.P. = Marked price -Discount.

A. If both assertion and reason are true and reason is the correct explanation of assertion. B. If both assertion and reason are true but

reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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5. Discount % =
$$\left(\frac{M. P. - S. P.}{M. P.}\right) \times 100$$

A. If both assertion and reason are true

and reason is the correct explanation of assertion.

- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false.
- D. If assertion is false but reason is true.



Exercise Comprehension Type Passage I

1.
$$P \%$$
 of $x = \frac{P}{100} \times x$.
Find 135% of 80 cm.

A. 10800 m

B. 10.8 m

C. 1.08 m

D. 108 m

Answer:



2. Find the number a , if 8.4% of a is 42 (ii) 0.5% of a is 3 $\frac{1}{2}$ % of a is 50 (iv) 100 % of a is 100

A. 500

B. 50

C. 5

D. 5000
Answer:



3.
$$P\%$$
 of $x = \frac{P}{100} \times x$.

What percent of 24 m is 6 m?

A. 0.6

B. 0.25

C. 0.05

D. 0.0625

Answer:



4. Ajit lost 20% of his money after which he was left with 6400. The amount he had in the beginning with him is

A. 8000

B. 9000

C. 7000

D. 1000



Exercise Comprehension Type Passage li

1. If C. P. = 620 and S. P. = 713, then profit

is

A. 73

B. 93

C. 1333

D. 13

Answer:

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2. If C.P. = 345, Profit = 98, then S.P. of the article

is

A. 443

B. 247

C. 434

D. 742

Answer:

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3. If the selling price of an article is greater than the cost price, the difference between selling price and cost price is called profit. If S.P. = Rs.3840, Profit = Rs. 62 then C.P. =

A. 2047

B. 3778

C. 3902

D. 2778

Answer:

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Exercise Subjective Problems Very Short Answer Type

- **1.** Find the ratio of:
- a. 90 cm to 1.05 m
- b. 35 minutes to an hour
- c. 150 mL to 2 L
- d. 2 dozens to a score



2. Find the ratio of:

8 kg to 400 gms.

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3. Find the ratio of the following:

5 m to 10 km

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4. Find the ratio of the following:

50 paise to 5 rupees

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5. Find the ratio of the following. (a) Speed of a cycle 15 km per hour to the speed of scooter 30 km per hour. (b) 5 m to 10 km (c) 50 paise to

Rs 5

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6. A certain company has 80 employees who are engineers. In this company engineers constitute 40% of its work force. How many people are employed in the company?



7. During one year, the population of a town increased by 5% and during the next year, the population decreased by 5%. If the total population is 9975 at the end of the second year, then what was the population size in the beginning of the first year?



8. Express 75 paise as a percent of Rs 8.



9. The ratio of bus and train fares from Calcutta to a certain place is 3:4. If the train fare increases by 20% and bus fare by 10% then what will be new ratio of bus and train fares ?



10. Rakesh purchased a car for 135000 and soon after he sold it for 142500. Find his gain percent.



11. A dishonest dealer professes to sell his goods at cost price, but he uses a weight of

960 grams for 1 kg. Find his gain percent.



12. Find the buying price of each of the following when 5% ST is added on the purchase of (i) A towel at Rs 50 (ii) Two bars of soap at Rs 35 each

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Exercise Subjective Problems Short Answer Type

1. Malvika gets 98 marks in her exams. This amounts to 56% of the total marks. What are the maximum marks?



2. A nursery has 5000 plantes. 5% of the planets are roses and 1% are mango plantes. What is the total number of other plants ?



3. The price of a Maruti car rises by 30%, while the sales of the car goes down by 20%. What is the percentage change in the total revenue?





4. By selling 144 pens, Jyoti lost the S.P.of 6

pens Find her loss percent.

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5. Mohit bought a CD for Rs. 750 and sold it

for Rs. 875. Find his gain percent.

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6. Mohan Lal purchased an old scooter for Rs.12000 and spent Rs. 2850 on its overhauling.Then, he sold it to his friend Sohanbir for Rs.13860.How much per cent did he gain or lose?



7. 200 kg of sugar was purchased at the rate ofRs 15 per kg and sold at a profit of 5%.Compute the profit and the selling price perkg.

8. Calculate amount and compound interest on 9600 for 3 years at $12\frac{1}{2}$ % p.a. compounded annually.

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9. Simple interest on a sum of money for 2 years at per annum is Rs 5200. What will be the compound interest on the sum at the same rate for the same period?





10. Find the compound interest on Rs 160000

for 2 years at 10% per annum when

compounded semi-annually.

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Exercise Subjective Problems Long Answer Type

1. Ranis weight is 25% that of Meenas and 40%

that of Taras. What percentage of Taras weight



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2. A man buys a plot of agricultural land for Rs 300000. He sells one-third at a loss of 20% and two-fifths at a gain of 25% . At what price must he sell the remaining land so as to make an overall profit of 10%?

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3. A man sold two articles at Rs 25920 each. These were sold at 8% gain and 4% loss respectively. Find the gain or loss percent in the whole transaction.

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4. A man bought two T.V. sets for 42500. He sold one at a loss of 10% and other at a profit of 10%. If the selling price of each T. V. set is same, determine the C.P. of each set.





6. If 50% of
$$(x - y) = 30\%$$
 of $(x + y)$, then $x = ky$

, find the value of 10 k.

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7. A shopkeeper buys 50 articles for 2000 and sells them for a profit of 10%. Find the selling price of one article.



8. The value of a T.V. depreciates every year by

25%. The value after a year if its present value

is 45,000 will be $3375 imes 10^n$. Find n.



9. Find n. 5. A person sells an article for 550,

gaining 1/10 of its C.P. If gain% is 10^n . Find n.



10. Shobha's Mathematics test had 75 problems i.e., 10 arithmetic, 30 algebra and 35 geometry problems. Although she answered 70% of the arithmetic, 40% of the algebra and 60% of the geometry problems correctly, she did not pass the test because in algebra she got less than 60% of the problems right. How

many more questions she would have needed

to answer correctly to score a 60% passing

grade?

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11. If $n\frac{n}{3}$ kg of pure salt must be added to 30 kg of 2% solution of salt and water to increase it to a 10% solution, then find n.

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12. Tanuj sold a sofa set for * 8800, thereby losing 12%. Had he sold it for 9600, what percent profit or loss would he have made?



13. In what time will * 1000 amount to 1331 at

10% per annum compounded annually?



14. The present population of town is 16000. If

it increases at rate of 5% p.a., what will be the

population after 2 years?



Olympiad Hots Cornet

1. A sum of money fetches a certain interest when it is invested for 4 years at the rate of 8% per annum. If it is invested for 6 years, then the interest increases by 640. Find the sum of

money.

A. 4050

B. 2000

C. 2050

D. 4000

Answer:

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2. The compound interest earned by Suresh on a certain amount at the end of two years at the rate of 8% per annum was 1414.40. What was the total amount that Suresh got back at the end of two years?

A. 9414.4

B. 9914.4

C. 9014.4

D. 8914.4

Answer:

3. Amar wrote exams in four subjects - Maths, Science, Hindi and Social Studies. The ratio of marks he got in these exams was 2:3:4:5. He got an aggregate of 70% in these exams. Each exam had the same maximum marks. In how many of these subjects did he get more than 50%?

A. 1

C. 3

D. 4

Answer:



4. If 540 is 10% of y and z% of y is 16200, then

find the values of y and z respectively.

A. 5400, 20

B. 5400, 300

C. 300, 5400

D. 20, 5800

Answer:



5. Two successive discounts of x % and y % on

a western gown is same as the single discount

of

A.
$$\left(x+y+rac{xy}{100}
ight)\%$$

B.
$$\left(x-y-rac{xy}{100}
ight)\%$$

C. $\left(x+y-rac{xy}{100}
ight)\%$
D. $\left(y-x-rac{xy}{100}
ight)\%$

Answer:



6. If A: B = 5: 6 and B: C = 7: 8, then by approximately what percent is C more than A?

A. 0.36

B. 0.4

C. 0.3714

D. 0.4823

Answer:

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7. Sonika spent 45760 on the interior decoration for her home, 27896 on buying air conditioner and the remaining 28% of the

total amount she had as cash with her. What

was the total amount?

A. 98540

B. 102300

C. 134560

D. 97500

Answer:



8. Simple interest on a sum of money for 1 year at 12% per annum is 1200. What will be the compound interest when compounded halfyearly on that sum at the same rate for the same period?

A. 1236

B. 1326

C. 11236

D. 13260

Answer:



9. A man borrowed 4000 at 10% per annum at compound interest. At the end of each year he has repaid 1000. The amount of money he still incurs after the third year is

A. 2740

B. 2104

C. 2014

D. 3400
Answer:



10. A shopkeeper fixes the marked price of a pair of shoes 45% above its cost price. What is the percentage of discount allowed to gain 16%?

A. 0.3

B. 0.25

D. 0.2

Answer:

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11. A man sells two articles each at 198. He makes a profit of 10% on one article and a loss of 10% on the other. Net profit or loss of the person is

A. 2% profit

B. 2% loss

C. 1% profit

D. 1% loss

Answer:

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12. The present population of a city is 8000. If it increases by 10% during the first year and by 20% during the second year, then population after two years will be A. 12400

B. 14400

C. 10560

D. none of these

Answer:

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13. A businessman fixed the selling price of an article after increasing the cost price by 40%. Then he allowed his customers a discount of

20% and gained 48. The cost price of the article is

A. 200

B. 248

C. 400

D. 448

Answer:



14. Find the compound interest on Rs 10,000 in 2 years at 4% per annum, the interest being compounded half yearly.

A. 6360.8

B. 82.43

C. 912.86

D. 828.82

Answer:



15. The difference between the compound interest (compounded annually) and simple interest on a certain sum at 10% per annum for 2 years is 3631. Find the sum.

A. 80100

B. 63100

C. 60000

D. 73100

Answer:

