



MATHS

BOOKS - KAPLAN INC MATHS

(ENGLISH)

RATES , RATIOS , PROPORTIONS, AND PERCENTAGES

Multiple Choice Question

1. An architect is working on a design for a solar power plant. While double-checking the blueprint, he realizes that he has made an error: The solar panels will not fit on the roof unless the dimensions of the roof are increased by 0.5%. Which of the following expresses this change in the dimensions of the roof as a fraction of the original dimensions?

A. $\frac{1}{2,000}$

B. $\frac{1}{200}$

C. $\frac{1}{20}$

D. $\frac{1}{2}$

Answer: B



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2. A graphic designer created an image for a school banner. He uses this image for small and medium banners. To produce a large banner, the designer increased the size of the

image by 12.5% to 18 inches tall by 22.5 inches wide. What was the size of the original image?

- A. 15 inches by 17.5 inches
- B. 15 inches by 18 inches
- C. 16 inches by 18.5 inches
- D. 16 inches by 20 inches

Answer: D



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3. A typical song downloaded from the Internet is 4 megabytes in size. Lindy has satellite Internet, and her computer downloads music at a rate 256 kilobytes per second. If 1 megabyte equals 1,024 kilobytes, about how many songs can Lindy download in 2 hours?

A. 128

B. 450

C. 1, 800

D. 1, 920

Answer: B



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4. A subway car passes 3 stations every 10 minutes. At this rate, how many stations will be it pass in 1 hour?



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5. Cecilia leaves home for school on her bike at 9:05 AM, riding at an average speed of 10 miles per hour. Fifteen minutes later, her mother realizes that Cecilia forgot to take her lunch. Cecilia's mother immediately gets into her car and drives after Cecilia at an average speed of 25 miles per hour. At what time will Cecilia mom catch up to her?

A. 9:15A

B. 9:20A

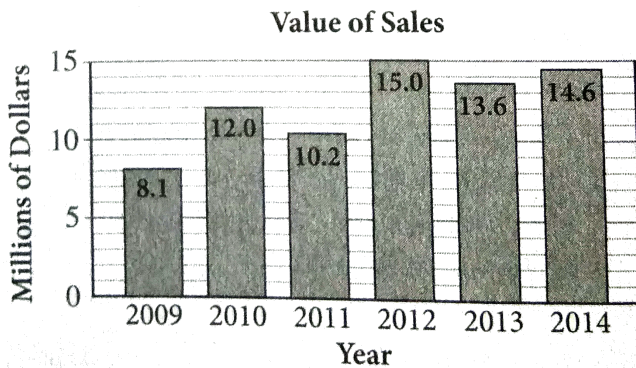
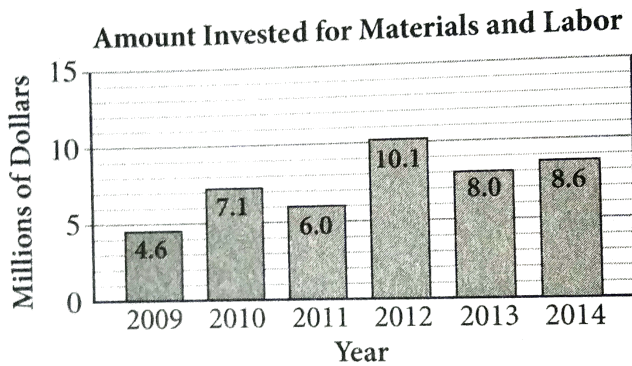
C. 9:26A

D. 9:30A

Answer: D



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6.

The bar show the amounts, in dollars, invested by company for material and labor to produce a certain product and the value of the sales for that product. The company claims that the

amount invested for materials and labor is never more than 60% of the value of the sales.

Which year or years disprove this claim?

A. 2010

B. 2012

C. 2014

D. 2012 and 2014

Answer: B



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7. A sporting goods store ordered an equal number of white and yellow tennis balls. The tennis ball company delivered 30 extra white balls, making the ratio of white balls to yellow balls 6.5. How many tennis balls did the store originally order?

A. 120

B. 150

C. 240

D. 300

Answer: D



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8. The density of a substance can be found by dividing the mass of the substance by the volume of the substance. The table gives the density of several pure metals in grams per cubic centimeter. Suppose a rectangular sheet of a pure metal weighs about 515.9 grams and measures $\frac{1}{4}$ inch by 2 inches by 8 inches. Assuming the sheet is one of the metals in the

table, which metal is it? (There are approximately 2.54 centimeters in 1 inch.)

Metal	Density (g/cm ³)
Copper	8.96
Iron	7.87
Nickel	8.90
Tin	7.26

A. Copper

B. Iron

C. Nickel

D. Tin

Answer: B



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9. A bike messenger delivers a package from the courthouse to a law firm downtown, traveling at an average speed of 24 miles per hour. On the way back, the bike messenger gets stuck in traffic, which reduces his average speed for the return trip by 12.5 percent . What was the bike messenger's average speed, in miles per hour, for the round trip?

A. 22

B. 22.1

C. 22.4

D. 22.5

Answer: C



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10. The mayor of Dunderville process a new ordinance that would give a tax credit to parent who homeschool their children. Ten percent of Dunderville's residents approve of

the ordinance. Of these, 7 out of 10 are women. All of Dunderville's other residents are against the ordinance. If there are equal numbers of men and women in Dunderville, then what fraction of Dunderville's male residents approve of the ordinance?

A. $\frac{3}{10}$

B. $\frac{3}{47}$

C. $\frac{3}{50}$

D. $\frac{3}{100}$

Answer: C



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11. Each crop duster who works for Gary's Crop Dustin' 4 Cheap can dust half an acre of crops in 25 minutes. The company must dust eight 0.75-acre lots and twelve 1.5-acre lots to complete a certain job. What is the minimum number of crop dusters needed to complete the job in 5 hours?

A. 4

B. 5

C. 6

D. 7

Answer: A



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12. Comix Fanartix has 250 customers who subscribe to its newsletter. 68% of whom are male. After some female customers cancel their subscriptions, the total number of the

subscribers becomes 1.3 times the number of male customers canceled their subscriptions?



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13. In preparation for buying house, Sevice and Juanita draft a budget to see how much they can afford. Their monthly spending and income are shown in the table. Numbers in parentheses indicate expenses (money being spent), numbers without parentheses indicate income (money being received):

numbers without paratheses indicate income (money being earned). Sergey and Juanita will not buy a house unless they can save atleast \$400 a month after all expenses, including the new mortgage payment and properrty taxes, are paid.

Category	Monthly Amount
Sergey's income (after taxes)	\$1,300
Juanita's income (after taxes)	\$1,600
Car insurance and gas	(\$220)
Food	(\$400)
Entertainment	(\$100)
Student loans	(\$550)
Phone and Internet	(\$120)

The couple would like to buy a house that costs \$230,000, for which the monthly

mortgage payment would be \$730, and the annual property taxes would be 2.5% of the purchase price. By what percent could Sergey and Juanita cut their monthly food spending in order to buy this particular house and meet their criteria for purchasing a house? (Ignore the percent sign and grid in your answer as a whole number.)



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14. Amal, Geoff, and Julia each have some fireworks. If Amal gives half of his firework to Geoff, then Amal and Geoff will have firework in a 2:3 ratio. If Julia has one-fifth as half his fireworks as Geoff (before Amal gives half his fireworks to Geoff), then what is the ratio of the number of fireworks Amal has to the number of fireworks Julia has (before Amal gives half his fireworks to Geoff)?

A. 20:1

B. 15:4

C. 3:2

D. There is insufficient information to determine the answer.

Answer: A



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15. An oil tank has two pipes connected to it. If the tank is empty, Pipe A can fill it in 2 hours. If the tank is full, Pipe B can empty it in 3 hours. If both pipes are activated at the same time.

When the tank is empty, how many hours will it take for the tank to be filled to 60% of its capacity?

A. 2.4

B. 3.6

C. 6

D. 60

Answer: B



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16. An all-natural health clinic stocks teas and herbs in a 5:11 ratio at one of its warehouse. In an effort to cut overhead costs, the owners close this warehouse and transfer its stock to a larger warehouse, increasing that warehouse's inventory of items by 20%. Which of the following could be the number of items at the larger warehouse after the transfer?

A. 198

B. 386

C. 480

D. 573

Answer: C



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17. John buy c pounds of cheese to feed m people at a party. If $m+n$ people come to the party, how many more pounds of cheese must John buy in order to feed everyone at the original rate?

A. $\frac{mn}{c}$

B. $\frac{m}{cn}$

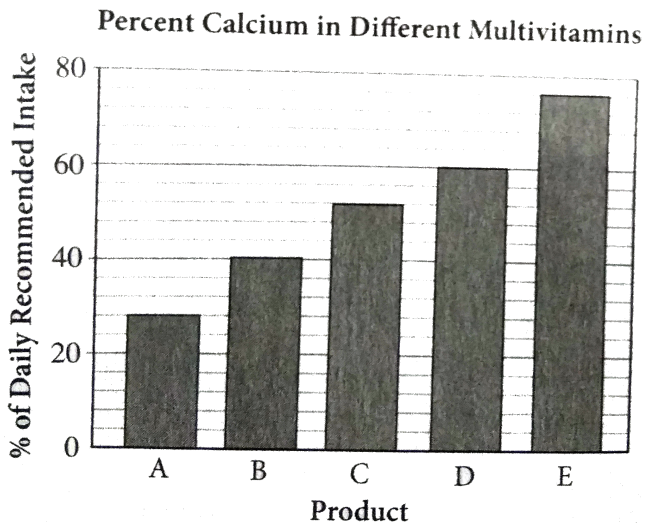
C. $\frac{m + n}{c}$

D. $\frac{nc}{m}$

Answer: D



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18.

The bar graph above shows the percent of the daily recommended intake of calcium supplied by five different multivitamins, A, B, C, D and E, per pill. Products A and D are sold in bottles of 75 pills and cost \$12 and \$18, respectively. Products B, C and E are sold in bottles of 50 pills and cost \$9.50, \$10.25 and 15.50,

respectively. Which of the five products supplies the greatest percentage intake of calcium per dollar?

A. A

B. B

C. C

D. D

Answer: C



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19. A typical 3-D printer creates object by laying down layers of ink one on top of another. The average thickness of layer depends on the caliber of the printer. For one particular 3-D printer, the average thickness of a layer is $102\mu m$ (micrometers). When creating a 1-inch cube, the printer takes 6 second to lay down each layer of ink. Approximately how long should it take this printer to create a 1-inch cube? (There are 1,000,000 micrometers in a meter, and 1 inch is approximately equal to 0.0254 meters.)

A. 12 minutes

B. 25 minutes

C. 40 minutes

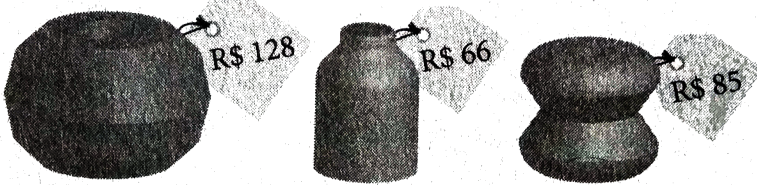
D. 1 hour, 6 minutes

Answer: B



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20. Eli left his home in New York and traveled to Brazil on business. Before he left, he used his credit card to purchase these pewter vases.



For daily purchases totalling less than 200 U.S. dollars. Eli's credit card company charges a 2% fee. If the total charge on his credit card for the vases was #126.48, what was the foreign exchange rate in Brazilian reais (R\$) per U.S. dollars on the day that Eli bought the vases? If necessary, round your answer to the nearest hundredth.



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