

Chapter 19 – Real Estate Math

1. C

Explanation: A straight note is one where the entire principal amount will be paid as a balloon payment at the end. Therefore, the interest is calculated on the entire principal amount each year. First, calculate each year's interest payment; you know the whole and the percentage, so use the formula $W \times \% = P$ ($\$265,000 \times .15 = \$39,750$). Multiply that figure by 10 years to calculate the total amount of interest ($\$39,750 \times 10 = \$397,500$).

2. C

Explanation: This requires you to convert from monthly rent to a gross income multiplier (which is based on yearly income). Multiply the monthly rent by 12 months ($\$1,200 \times 12 = \$14,400$) and then multiply the annual income by the gross income multiplier ($\$14,400 \times 10.72 = \$154,368$).

3. C

Explanation: Don't forget to add six inches to each wall in order to calculate the exterior dimensions of the building. The exterior dimensions, therefore, should be 26 feet by 31 feet. Multiply 26 feet by 31 feet to arrive at a square footage of 806 square feet.

4. D

Explanation: First, convert the area of the lot from square yards to square feet ($900 \text{ square yards} \times 9 \text{ square feet per square yard} = 8,100 \text{ square feet}$). Then, divide the square footage by the frontage to determine the depth ($8,100 \text{ square feet} \div 45 \text{ feet} = 180 \text{ feet}$).

5. A

Explanation: First, multiply the width by the length to calculate square footage ($220 \text{ feet} \times 330 \text{ feet} = 72,600 \text{ square feet}$). Divide the square footage to calculate the acreage ($72,600 \text{ square feet} \div 43,560 \text{ square feet per acre} = 1.66 \text{ acres}$).

6. A

Explanation: First, calculate the annual interest payment; you know the whole and the percentage, so use the formula $W \times \% = P$ ($\$1,140,000 \times .07 = \$79,800$). Divide that amount by 12 to calculate the first interest payment ($\$79,800 \div 12 = \$6,650$). Subtract that amount from the standard monthly payment to calculate how much will be applied to principal ($\$8,000 - \$6,650 = \$1,350$).

7. C

Explanation: Because one of the edges of the farm is a diagonal line, we'll need to break the farm down into component shapes to solve this problem. There should be a triangle that is 3,960 feet high and 7,920 feet wide, and below that should be a rectangle that is 3,960 feet high and 7,920 feet wide. First, calculate the area of the triangle ($1/2 \times 3,960 \text{ feet} \times 7,920 \text{ feet} = 15,681,600 \text{ square feet}$). Next, calculate the area of the rectangle ($3,960 \text{ feet} \times 7,920 \text{ feet} = 31,363,200 \text{ square feet}$). Add the two areas together ($15,681,600 \text{ square feet} + 31,363,200 \text{ square feet} = 47,044,800 \text{ square feet}$) and divide into acres ($47,044,800 \text{ square feet} \div 43,560 \text{ square feet per acre} = 1,080 \text{ acres}$).

8. B

Explanation: First, calculate the annual income from the investment ($\$750 \text{ per month} \times 12 \text{ months} = \$9,000 \text{ per year}$). Now calculate the total investment amount; you know the part and the percentage, so use the formula $P \div \% = W$ ($\$9,000 \div .05 = \$180,000$).

9. B

Explanation: All that needs to be done to solve this question is divide the annual income by the new capitalization rate ($\$18,000 \div 12\% = \$150,000$). Because the desired rate and annual income are known, there's no need to know the value at a 9% rate.

10. B

Explanation: Multiply the property value by the tax rate to find the annual tax ($\$600,000 \times .0115 = \$6,900$). Divide the annual tax by 12 to find the monthly payment ($\$6,900 \div 12 = \575).

11. C

Explanation: First, calculate the frontage of the owner's lot ($17,550 \text{ square feet} \div 150 \text{ foot depth} = 117 \text{ foot frontage}$). Calculate the frontage of the neighboring lot ($9,000 \text{ square feet} \div 150 \text{ foot depth} = 60 \text{ foot frontage}$). Add the two frontages to calculate the total frontage ($117 \text{ feet} + 60 \text{ feet} = 177 \text{ feet}$).

12. B

Explanation: This question requires the calculation of a gross rent multiplier. Divide the sale price of the house across the street by its monthly rent to calculate the gross rent multiplier ($\$180,000 \div \$1,200 = 150$). Now multiply the subject property's monthly rent by the gross rent multiplier to calculate its value ($\$1,280 \times 150 = \$192,000$).

13. C

Explanation: It can be helpful to plug hypothetical numbers into this problem. Let's say that she paid 80% of the listed price where the property was listed at $\$100,000$ ($\$100,000 \times .8 = \$80,000$). The difference between the listed price and sale price is $\$20,000$ ($\$100,000 - \$80,000 = \$20,000$). Divide the amount of profit she made on the deal by the amount she paid to calculate the percentage of profit ($\$20,000 \div \$80,000 = .25$).

14. B

Explanation: First, calculate the property's gross income ($\$3,000 \times 12 \text{ months} \times 5 \text{ years} = \$180,000$). Subtract the three months of vacancies ($\$3,000 \times 3 \text{ months} = \$9,000$) ($\$180,000 - \$9,000 = \$171,000$) and divide by 5 to determine the average income over five years ($\$171,000 \div 5 = \$34,200$). Now subtract the operating expenses to calculate the annual net income ($\$34,200 - \$9,000 = \$25,200$). Divide the net income by the capitalization rate to find the value of the property ($\$25,200 \div .1 = \$252,000$).

15. B

Explanation: First, calculate what the annual amount of interest paid would be; you know the whole and the percentage, so use the formula $W \times \% = P$ ($\$70,000 \times .09 = \$6,300$). Divide this amount by 12 to see what the monthly payment is ($\$6,300 \div 12 = \525 per month). Divide $\$9,450$ by the monthly payment to determine how many months elapsed ($\$9,450 \div \$525 = 18 \text{ months}$).