Math Review – Test #1
Revised October 2018

1. Seller A and Buyer B have agreed to share all closing costs with A paying 60% and B paying 40%. If the title insurance is $500, document preparation and recording fees are $225 and miscellaneous expenses are $248, how much more will A pay than B?

2. A buyer purchased two lots, each 75 feet by 125 feet for a total of $76,000. What was the price per square foot?

3. Listing agent Bob is affiliated with Managing Broker Lisa and lists a property for $389,900 at a commission rate of 6%. Selling agent Sally affiliated with Managing Broker Joe sells that property for $369,900. Lisa’s firm pays a “co-op” fee of 50% of the gross fee to Joe’s firm. Lisa and Bob are on a 60%/40% split with 60% going to Bob, and Joe and Sally are on a 70%/30% split with 70% going to Sally. How much did Managing Broker Joe retain in the end?

4. A property is 210 feet deep with 85 feet of frontage. If is sold for $15.75 per square foot plus a premium of $300 per frontage foot, what would the sale price be?

5. A rectangular parcel priced at $7.75 per square foot sells for $96,875. If the parcel is 62.5 feet deep, what is the price per front foot?

6. A three acre parcel was purchased for $86,000. The owner’s neighbor wants to purchase a 25ft X 200 ft strip of that land. If the owner sells that strip for a 10% profit, what would it sell for?

7. A brokerage firm has all of their brokers on a 100% commission plan. The broker’s monthly desk cost is $1,500 and there is a $150 per transaction fee to cover administrative costs. The firm also deducts any marketing/advertising fees from any earned commissions. This month the broker had 4 closings earning the following commissions: $12,400, $4,450, $6,785 and $1,750. If the broker’s marketing costs totaled $2,225 this month, what would the broker’s net earnings be for this month?
8. Which of the following sales would utilize the most leverage?

a. $500,000 sale price with an 85% LTV
b. $400,000 sale price with 10% down payment
c. $300,000 sale price with an 85% LTV
d. $100,000 sale price with $5,000 down payment

9. Stephanie bought her home 4 years ago for $300,000 and borrowed $210,000 at that time. Over that time, her home has appreciated 12.5%, and she has reduced her mortgage balance by $48,000. What is her current equity?
**Question #1 Solution:**

$500 $973 $973 $583.80
$225 \times 0.60 \times 0.40 -389.20
$248 $583.80 $389.20 $194.60 more

$973

**Question #2 Solution:** (note: there are two lots, one of the likely wrong answers would be the result if calculating it with only one lot)

**Step 1:** 75’ x 125’ = 9,375 square feet per lot

\[ \times 2 \text{ lots} \]

= 18,750 total square footage

**Step 2:** $76,000 ÷ 18,750 = $4.05 per square foot

**Question #3 Solution:**

$369,900 Sales price

\[ \times 0.06 \text{ Commission rate} \]

$22,194 Gross fee

\[ \times 0.50 \text{ Co-op split} \]

$11,097 Co-of fee

\[ \times 0.30 \% \text{ retained by Joe} \]

$3,329.10 $ retained by Joe

**Question #4 Solution:**

**Step 1:** Calculate total square footage

\[ 210’ \times 85’ = 17,850 \text{ sq. ft. total area} \]

**Step 2:** Calculate per sq. ft. portion of price

\[ \times 15.75 \]

$281,137.50

**Step 3:** Calculate frontage premium

\[ \times 85 \text{ feet of frontage} \]

$25,500 frontage premium

**Step 4:** Calculate total price

$281,137.50 \text{ cost per sq. ft.} + $25,500 \text{ frontage premium} = $306,637.50 \text{ total price}

**Question #5 Solution:**

**Step 1:** Calculate total area

\[ \frac{96,875 \text{ total price}}{7.75 \text{ price per square foot}} = 12,500 \text{ total square footage} \]

**Step 2:** Calculate frontage

\[ 12,500 \text{ total square footage} \div 62.5’ \text{ depth} = 200’ \text{ frontage} \]
#5 Solution cont.
(note: so long as the parcel is square or rectangular, length X width or depth X frontage = total area, so total area divided by one side = the other side, thus total area divided by depth = frontage)

**Step 3:** Calculate price per front foot

\[
\frac{96,875 \text{ total price}}{200 \text{ front or frontage feet}} = \frac{484.38 \text{ price per front foot or frontage foot}}{}
\]

**Question #6 Solution:**

**Step 1:** Calculate square footage of three acres

\[
43,560 \text{ square feet in an acre} \times 3 = 130,680 \text{ sq. ft. in 3 acres}
\]

**Step 2:** Calculate price per square foot

\[
\frac{86,000 \text{ price}}{130,680 \text{ total area}} = \frac{.658 \text{ price per sq. ft.} \text{ (note: take to 3rd decimal place)}}{}
\]

**Step 3:** Calculate area or square footage of strip of land

\[
200' \times 25' = 5000 \text{ sq. ft.}
\]

**Step 4:** Calculate price of strip at original cost

\[
5000 \text{ area or square footage of strip} \times .658 \text{ price per sq. ft.} = 3,290 \text{ price of strip at original cost}
\]

**Step 5:** Add 10% profit

\[
3,290 \text{ original cost of strip} \times 1.10 \text{ inflate to 110% of cost} = 3,619.00 \text{ price w/ 10% profit or 110% of cost}
\]

(note, you could multiply by 10% then add to original )

**Question #7 solution:**

**Step 1:** Calculate the gross commissions earned

$12,400

$4,450

$6,785

+$1,750 \text{ Commissions} = 25,385 \text{ Total/Gross commissions earned}

**Step 2:** Deduct/subtract desk cost, transaction/administration fees, and marketing fees

\[
25,385 \text{ Gross commissions earned} - 1,500 \text{ - Monthly desk cost} - 600 \text{ - Transaction fees (4 closings X $150 each)} - 2,225 \text{ - Marketing fees} = 21,060 \text{ Net earnings for the month}
\]
**Answer Question #8:** Note: Leverage is the use of borrowed money

The answer is “d”. Leverage is the use of debt. A $100,000 sale with a $5,000 down payment uses 95% leverage, i.e. a 95% LTV. This is the most leverage as a percentage of the sale price of the 4 choices. It’s not the dollar amount of debt, it’s the percentage of borrowed money or “leverage” used.

**Answer Question #9:** Note: (Equity is current value less total debt)

\[
\begin{align*}
\text{Original value} & \quad \text{Original loan balance} \quad \text{Current value} \\
$300,000 & \quad $210,000 & \quad $337,500 \\
\times 0.125 \quad \text{or 12.5% appreciation} & \quad $48,000 \quad \text{Principal reduction} \quad -$162,000 \\
= $37,500 \quad \text{appreciation} & \quad $162,000 \quad \text{Current loan balance} \quad = $175,500 \quad \text{Equity} \\
+ $300,000 \quad \text{original value} & \quad = $337,500 \quad \text{appreciated value} \\
= $337,500 & \quad \text{appreciated value}
\end{align*}
\]

**OR:** as an alternate approach to finding the appreciated value.

\[
\begin{align*}
\text{Original Value} & \quad \times 1.125 \\
$300,000 & \quad $337,500 \quad \text{Appreciated value is 112.5% of the original value}
\end{align*}
\]