Mortgage Calculations

Directions:
Answer the following questions. Show your work.

1. The Andres family has $40,000 for a down payment on a house and closing costs. They need a loan to cover the remaining expenses on a house they will purchase for $150,000. The closing costs are five percent of the home value. How much will the mortgage or home loan be?

$$150{,}000(.05) = Closing\ Costs$$
$$7{,}500 = Closing\ Costs$$
$$40{,}000 - 7{,}500 = Down\ payment$$
$$32{,}500 = Down\ payment$$
$$150{,}000 - 32{,}500 = Home\ Loan$$
$$117{,}500 = Home\ Loan$$

2. Would this payment require mortgage insurance? If so, how much more would they need to pay to avoid mortgage insurance?

$$\frac{117{,}500}{150{,}000} = Loan\ to\ value\ ratio$$
$$.78 = Loan\ to\ value\ ratio$$

Yes, this would require mortgage insurance.

$$\frac{x}{150{,}000} = .8$$
$$\frac{x}{150{,}000} \cdot 150{,}000 = .8 \cdot 150{,}000$$
$$x = 120{,}000$$
$$120{,}000 - 117{,}500 = Additional\ Down\ payment$$
$$2{,}500 = Additional\ down\ payment$$

STUDENT ACTIVITY ANSWER KEY

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3. How much will the monthly payment for the Riaz family's home loan of $120,000 be if the loan is a 15 year loan with an interest rate with five percent5% annual interest rate?

$$M = \frac{120{,}000(.0042(1+.0042)^{180})}{((1+.0042)^{180}-1)}$$

$$M = \frac{120{,}000(.0042(1.0042)^{180})}{((1.0042)^{180}-1)}$$

$$M = \frac{120{,}000(.0042(2.1264))}{(2.1264-1)}$$

$$M = \frac{120{,}000(.0089)}{1.1264}$$

$$M = \frac{1068}{1.1264}$$

$$M = 948.15$$

4. How much will the monthly payment for the Riaz family's home loan be if the loan was a 30 year loan with an annual interest rate of three percent?

$$M = \frac{120{,}000(.0025(1+.0025)^{360})}{((1+.0025)^{360}-1)}$$

$$M = \frac{120{,}000(.0025(1.0025)^{360})}{((1.0025)^{360}-1)}$$

$$M = \frac{120{,}000(.0025(2.4568))}{(2.4568-1)}$$

$$M = \frac{120{,}000(.0061)}{1.4568}$$

$$M = \frac{732}{1.4568}$$

$$M = 502.47$$

STUDENT ACTIVITY ANSWER KEY

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5. The Riaz family decides to go with the fifteen year loan. Make an amortization schedule for the first year of payments. Mr. Riaz receives a quarterly bonus, so he will pay an extra $1,000 in March, June, September and December, make sure to include these in the schedule.

Month	Current Principal	Payment	Interest Payment	Principal Payment
January	$120,000	**$948.15**	**$504**	**$444.15**
February	**$119,555.85**	**$948.15**	**$502.13**	**$446.02**
March	**$119,109.84**	**$1948.15**	**$500.26**	**$1,447.89**
April	**$117,661.95**	**$948.15**	**$494.18**	**$453.97**
May	**$117,207.98**	**$948.15**	**$492.27**	**$455.88**
June	**$116,752.10**	**$1948.15**	**$490.36**	**$1,457.79**
July	**$115,294.31**	**$948.15**	**$484.24**	**$463.91**
August	**$114,830.40**	**$948.15**	**$482.29**	**$465.86**
September	**$114,364.54**	**$1948.15**	**$480.33**	**$1467.82**
October	**$112,896.72**	**$948.15**	**$474.17**	**$473.98**
November	**$112,422.74**	**$948.15**	**$472.18**	**$475.97**
December	**$111,946.77**	**$1,948.15**	**$470.18**	**$1,477.97**