

CHAPTER 2: ESTIMATING

Many times you do not have to find the exact value of the answer. You can find an estimate and check choices for reasonableness. One technique to help you estimate is rounding.

Rules of Rounding

- Locate the digit in the place value to which you are rounding.
- Increase this digit by 1 if the next digit to the right is 5 or greater.
- Leave the digit unchanged if the next digit to the right is less than 5.

EXAMPLE 1

Round 4,582 to the indicated place value position.

- a) The nearest ten b) to the nearest hundred c) to the nearest thousand

SOLUTION TO EXAMPLE 1

- a) The digit in the tens place is 8. The number to the right is 2. So we leave the digit unchanged. So the answer is **4,580**.
- b) The digit in the hundreds place is 5. The digit to the right is 8. So we increase our digit by 1 (from 5 to 6). Thus our answer is **4,600**.
- c) The digit in the thousands place is 4. The digit to the right is 5. So we increase our digit by 1 (from 4 to 5). Thus our answer is **5,000**.

EXAMPLE 2

Find the actual answer. Use rounding to estimate the answer and compare to see if you actual answer is reasonable.

- a) $3,234 + 2,578$ b) $796 - 308$ c) 93×198 d) $836 \div 22$

SOLUTION TO EXAMPLE 2

a)	Actual	Estimate	b)	Actual	Estimate
	3,234	3,000		796	800
	+ 2,578	+ 3,000		- 308	- 300
	<u>5,812</u>	<u>6,000</u>		488	500
c)	Actual	Estimate	d)	Actual	Estimate
	198	200		$\frac{38}{22} \overline{)836}$	$\frac{40}{20} \overline{)800}$
	$\times 93$	$\times 90$			
	<u>18,414</u>	<u>18,000</u>			

Test-Taking Strategy: If the problem is a multiple choice, do you really need to find the exact answer? As a strategy, you can find the estimate and pick the answer that is closest to your estimate.

MATHEMATICS COMPETENCY EXAM STUDY GUIDE – PART A

EXAMPLE 3

Friday's attendance at a baseball game was 21,904 people. The attendance at the baseball game on Saturday was 38,503.

- a) What was the total amount of people who attended the baseball game on Friday and Saturday?
- b) How many more people attended the baseball game on Saturday than on Friday?

SOLUTION TO EXAMPLE 3

Before we do the work, let's think about the problem and the type of problem. If this were a multiple choice question, I would just work out the estimate and look for the closest answer. But since it is not a multiple choice problem, I would need to show all work. I did both below.

	a)	Actual	Estimate	Estimate 2		b)	Actual	Estimate	Estimate 2
		21,904	20,000	22,000			38,503	40,000	39,000
		<u>+ 38,503</u>	<u>+ 40,000</u>	<u>+ 39,000</u>			<u>- 21,904</u>	<u>- 20,000</u>	<u>- 22,000</u>
		60,407	62,000	61,000			16,599	20,000	17,000

NOTE: I did two different estimates for my answers. The first estimate I rounded to the nearest ten-thousands. For the second estimate, I rounded to the nearest thousand. Does it matter which estimate you use? Not really, but notice when we look at Estimate 2, it is a lot closer to the Actual answer. On a multiple choice question, if your answers are very close to each other, you would probably get a better answer when you round to the tens or hundreds.

TRY-THESE – Estimating

Round each of the following.

- | | |
|-------------------------------|----------------------------------|
| 1. 684 to the nearest hundred | 2. 8,237 to the nearest thousand |
| 3. 1,539 to the nearest ten | 4. 7,928 to the nearest hundred |

Estimate. Then choose the letter of the actual answer.

- | | | | |
|-----------------------------|----------|----------|----------|
| | A | B | C |
| 5. $27 \times 32 \times 49$ | 423,360 | 4,233 | 42,336 |
| 6. $83,978 \div 398$ | 21 | 211 | 441 |
| 7. $1,594 + 375 + 8,946$ | 10,917 | 9,695 | 18,904 |
8. There are 12 rows of seat in an auditorium with 48 seats in each row.
- a) Approximately how many people will fit in the auditorium?
 - b) There are 850 students that want to go to a concert in the auditorium. Will they all be able to be seated in the auditorium?