

Midterm Review

Use the following questions to review for your *Midterm Test*. Your teacher will assign each question to a small group of students. Each group will prepare a display, then present solutions to the class. You may use the *Math Practices* page and the *Addition, Subtraction, and Multiplication Strategies Menu* pages in the Reference section. Show your work for all problems.

1. The Student Council at John Mills School organized a school-wide collection of footwear to donate to needy children. The table represents some of the items collected:

F Type of Footwear	N Number of Pairs Collected
Gym shoes	1297
Casual shoes	735
Boots	478

Use the data in the table and a paper-and-pencil method to solve the following problems. Estimate to be sure your answers are reasonable.

- How many more pairs of gym shoes were collected than casual shoes?
- How many fewer pairs of boots were collected than casual shoes?
- What is the total number of pairs of casual shoes and boots?
- The student councils at two neighboring schools also held a footwear donation drive. Each school collected an equal number of pairs of boots as John Mills School. How many total pairs of boots were collected?
- How many total pairs of footwear were collected at John Mills School?
- Write in words the total number of pairs of footwear collected at John Mills School.
- Show or tell how you can use mental math to solve Question 1A.
- Show or tell how you can use estimation to make sure your answer to Question 1D is reasonable.



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Questions 1–4

- I. A. 562 more gym shoes;

$$\begin{array}{r} 1297 \\ - 735 \\ \hline 562 \end{array}$$

Compact Method

- B. 257 pairs of footwear;

$$\begin{array}{r} 6121 \\ \cancel{7}35 \\ - 478 \\ \hline 257 \end{array}$$

Compact Method

$$\begin{array}{r} 600 + 120 + 15 \\ - 400 + 70 + 8 \\ \hline 200 + 50 + 7 \end{array}$$

Expanded Form

- C. 1213 pairs of boots and casual shoes;

$$\begin{array}{r} 735 \\ + 478 \\ \hline 1213 \end{array}$$

Compact Method

- D. 1434 pairs of boots;

$$\begin{array}{r} 22 \\ 478 \\ \times 3 \\ \hline 1434 \end{array}$$

Compact Method

$$\begin{array}{r} 400 + 70 + 8 \\ \times 3 \\ \hline 1200 + 210 + 24 = 1434 \end{array}$$

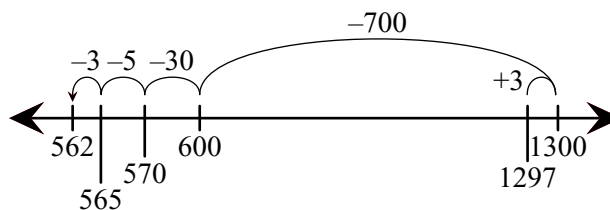
Expanded Form

- E. 2510 pairs of footwear;

$$1297 + 735 + 478 = 2510$$

- F. two thousand five hundred ten

- G. I thought about a number line. First I started at 1297 went forward 3 to 1300. I counted back 700 and landed on 600 and then counted back 30 to 570 and then 5 to 565. Finally, I knew I had to count back 3 more since I had added 3 in the beginning. I landed on 562 for my answer.



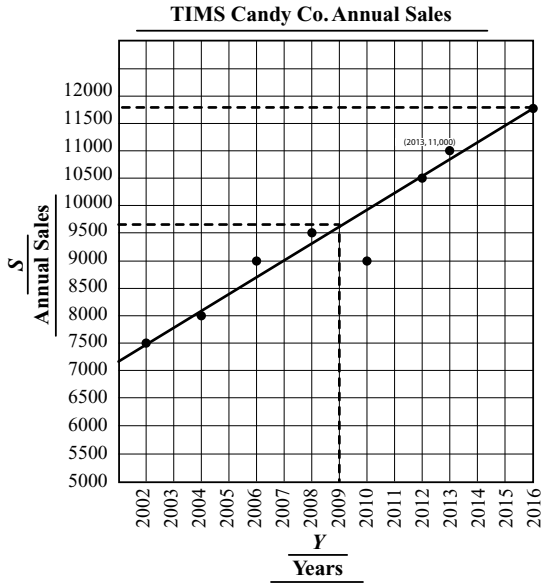
- H. I know that 478 is close to 500 so I thought 500×3 is 1500, so my answer needs to be less than 1500 since 478 is less than 500. My answer was 1434, so that is reasonable.

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2. A.

Year	Annual Candy Sales	Sales Rounded to Nearest \$500	Ordered Pair (Year, Sales)
2002	\$7349	\$7500	(2002, 7500)
2004	\$8168	\$8000	(2004, 8000)
2006	\$9199	\$9000	(2006, 9000)
2008	\$9445	\$9500	(2008, 9500)
2010	\$8830	\$9000	(2010, 9000)
2012	\$10,760	\$10,500	(2012, 11,000)

B–C. One possible graph and best-fit line:



- D. 2010; Answers will vary. Students may say that the line was still the same but that the data point for 2010 was below the line.
- E. Answers may vary but should be between \$9500 and \$10,000 for 2009; interpolation.
- F. Answers may vary but should be between \$10,500 and \$11,000 for 2016; extrapolation
- G. (2013, 11,000); Answers will vary but it is likely that this point will fall very close to the best-fit line.
- H. $10,000 + 1000 + 200 + 5 = 11,205$; eleven thousand two hundred five.

2. The table shows the annual candy sales for the TIMS Candy Company for some of the years between 2002 and 2012.

Y Year	S Annual Candy Sales	S Sales Rounded to Nearest \$500	Ordered Pair (Y, S)
2002	\$7349	\$7500	
2004	\$8168		
2006	\$9199		(2006, 9000)
2008	\$9445		
2010	\$8830		
2012	\$10,460		

- A. Copy the table. Complete the table by first rounding each price to the nearest \$500 and then writing the ordered pairs using the rounded values.
- B. Use the ordered pairs to make a point graph using *Centimeter Graph Paper*. Plot the Year on the horizontal axis starting with 2002. Include the years through 2016. Plot the Sales on the vertical axis starting with \$5000.
- C. If the points suggest a line, use your ruler to draw a best-fit line.
- D. In which year did the annual candy sales not go up? Did this data point change how you drew your best-fit line? If so, how did it change it? Explain.
- E. Use your graph to estimate the annual candy sales for 2009. Did you use interpolation or extrapolation?
- F. Use your graph to predict the annual candy sales for 2016. Did you use interpolation or extrapolation?
- G. The annual candy sales for 2013 were \$11,205. Round \$11,205 to the nearest \$500 and then plot this point on your graph. Does this point fall above or below your best-fit line?
- H. Write the number 11,205 in expanded form and using words.



3. Beth was tracking her progress improving her keyboarding skills. She tested herself often to check her progress then recorded the highest Number of Words Correct each week. She made the following data tables. Copy and complete the second table with the ordered pairs.

Week Tested	Number of Tests Taken	Week Tested	T Time in Seconds	N Number of Words Correct	Ordered Pairs (T, N)
Week 1	2	Week 1	30	11	
Week 2	5	Week 2	60	22	
Week 3	3	Week 3	90	38	
Week 4	2	Week 4	120	45	
Week 5	3	Week 5	150	60	

- What is the median number of tests Beth took per week? What is the mean?
- What is the median number of words correct?
- Make a point graph of Beth's progress using *Centimeter Graph Paper*. Choose a scale that will leave room to make predictions.
- If the points lie close to a straight line, use a ruler to draw a best-fit line.
- Predict the number of words correct Beth will have on a 180 second (3 minute) test. Explain how you made your estimate.
- Is Beth improving? Explain your reasoning.
- Are any of the numbers in the Number of Words Correct column of the data table prime numbers? If so, which ones? Show or tell how you know.
- What are the factors for the number of words Beth typed correctly in Week 4?



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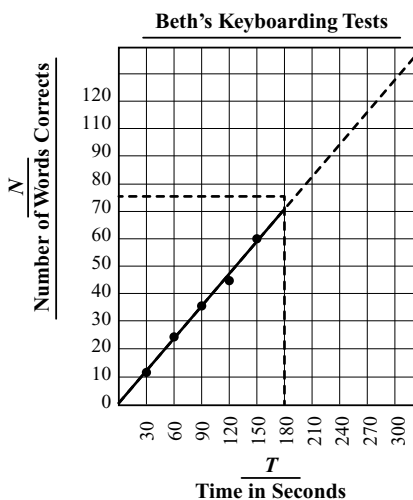
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3.

Week Tested	T Time in Seconds	N Number of Words Correct	Ordered Pairs (N, T)
Week 1	30	11	(30, 11)
Week 2	60	22	(60, 22)
Week 3	90	38	(90, 38)
Week 4	120	45	(120, 45)
Week 5	150	60	(150, 60)

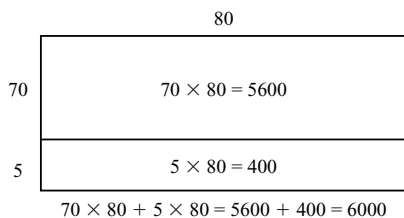
- The median is 3 tests; The mean is 3 tests
- 38 words correct
- D. One possible graph and best-fit line:



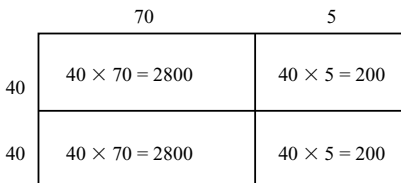
- About 75 words; I used my graph and best-fit line. I found 180 on the horizontal axis and then went up to the best-fit line and read across to the vertical axis.
- Students may say Beth is improving because of the slant of the line on the graph and the number of words on the table is increasing. However it is also taking her more time to complete each test. If Beth got 11 words correct in the 30 seconds you would expect her to get about 55 words correct in 150 seconds ($5 \times 30 = 150$ and $5 \times 11 = 55$). Beth got 60 words correct in 150 seconds, showing only a small improvement.
- Yes, 11 words in Week 1 is a prime number because it's only factors are 1 and 11.
- 1, 3, 5, 9, 15, 45

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4. A. 6000 sq. ft.; Possible response:



B. Possible response:



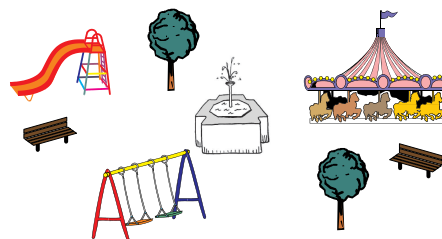
$40 \times 70 + 40 \times 70 + 40 \times 5 + 40 \times 5 = 2800 + 2800 + 200 + 200 = 6000$
 Or $40 \times 70 + 40 \times 5 = 3000$ and $3000 \times 2 = 6000$

C. 310 ft.; $75 + 75 + 80 + 80 = 310$ or $2 \times 75 + 2 \times 80 = 150 + 160 = 310$

D. 3605 sq. ft. remaining;
 water fountain area: $20 \times 20 = 400$
 slide area: $24 \times 30 = 720$
 swing area: $25 \times 35 = 875$
 mini-carousel area: $20 \times 20 = 400$;
 $400 + 720 + 875 + 400 = 2395$ and
 $6000 - 2395 = 3605$

E. 9605 sq. ft., 2×6000 sq. ft. = 12,000 sq. ft.
 and
 $12,000$ sq. ft. - 2395 sq. ft. = 9605 sq. ft.

4. The residents of TIMS Town wanted to build a small park. The Town Council agreed and began to plan for the new park. Here are some of the proposals:
- The total park will measure 75 feet X 80 feet.
 - The water fountain will need an area of 20 X 20 feet.
 - The slide area will need an area of 24 feet X 30 feet.
 - The swing area will need an area of 25 feet X 35 feet.
 - The mini-carousel will need an area of 20 X 20 feet.
 - The remaining area may be used for benches and ball-play areas as well as landscaping.
- A. What is the area of the park? Sketch a rectangle and use the break-apart method to find the area. Write number sentences on each part to show the number of square feet in each part.
- B. Show another way to break the rectangle apart to find the area.
- C. What is the perimeter of the park?
- D. After the water fountain, slide, swing, and mini-carousel areas are built, what is the remaining area for the bench and ball-play areas?
- E. The skate park in TIMS Town is twice as large as the new park. If the water fountain, slide, swing, and mini-carousel areas were built in the area of the skate park, what would be the remaining area?



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