

HIGH SCHOOL MATHEMATICS PREPARATION



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Effective Study and Test Taking Strategies

Maximize your efforts!



Use Active Study Strategies

This means involving your senses and thinking consciously about your studying. Active studying increases your memory and understanding of the material.

- Verbalize information instead of reading silently: this increases sensory input to the brain.
- Re-organize the course material in a logical way - how do the concepts fit together? Try creating a 'concept map.'
- Teach the material to someone else. This is one of the best ways to learn it yourself.
- Use the 3R's: Read, Write, Recite the material.
- Involve physical movement or senses where appropriate.



Predict Questions

Students generally spend too much study time taking in information and not enough time practising how to use this information in the exam format. Predicting questions and answering them will help you to consider what will be on the exam and give you practice in answering the types of question that you'll be facing.

- Use the course outline, previous tests, course notes, and any information given by the instructor to make up possible test questions, then practise answering these questions.
- Try this strategy with a study partner, trading questions to give you a new perspective.
- Set a time limit that reflects the amount of time you will have in the exam.
- Make sure to correct your answers, and then focus your studying on the areas in which you made the most mistakes.



Find a Study Partner or Form a Study Group

Working with someone else can give you a different perspective on course materials, and a lot can be accomplished by sharing skills and resources with others. Some suggested activities for group studying:

- Practise teaching each other the material.
- Brainstorm possible test questions.
- Compare lecture notes.

- Conduct discussions or debates on selected course topics.
- Quiz each other on factual material.
- Join one of the study groups opportunities offered by the guidance office next week.



Create Diagrams to Help Summarize Information

- Brainstorm ideas/concepts that are related to a chosen topic.
- Draw a diagram to provide a pictorial representation of the subject.
- Try a concept map with the most important idea in the centre, and then various branches showing the relationships between other ideas and their subcategories.



Use Strategies to Help Reduce Forgetting

- Test yourself as you study.
- Over-learn the material so that you can't forget it.
- Use mnemonics
 - acronyms (BEDMAS)
 - analogies (lungs = trees, pump = heart)
 - key words linked to other information



Try Flashcards

- Write the question on one side, the answer on the other.
- Use them to memorize definitions, vocabulary, facts, formulae, etc.
- Carry them with you to study in short, spare moments, such as while waiting in line or riding the bus.

Exam Vocabulary

1. **Compare:** Note the similarities and differences
2. **Contrast:** Compare to highlight differences
3. **Criticize:** Judge and discuss the good and bad points
4. **Define:** Explain or identify and make it long enough to fully explain the word.
5. **Evaluate:** Analyze carefully and give reasons for and against
6. **Explain:** Make the meaning of something clear and understandable
7. **Illustrate:** Use specific examples or analogies to explain
8. **Relate:** Give an account of events and or circumstances to establish association, connections or relationships
9. **Summarize:** State the main facts in concise form

◆◆ TEST TAKING TIPS ◆◆

- When reading your text book, start at the end of the chapter. Read the summary first. Highlight or take brief notes so you will know what you're reading for.

- Review regularly what you have learned - we forget 75-90% of what we have learned, if not reviewed.
- You will remember more if you study in short sessions, e.g. a series of 15-20 minute focus sessions, with a 5 minute break in between each is often more effective.



Multiple Choice Questions:

- Try to answer the question yourself before looking at the answers given.
- Underline key words. This can help you untangle complicated questions.
- Cross out the answers you know are incorrect and select your answers from the remaining options.
- Never leave a question unanswered unless there is penalty for incorrect answers.



Essay Questions:

- If you have a choice, read all the questions over carefully before choosing one. Make sure you are answering the teacher's question.
- You can develop a good thesis statement by turning the exam question into a statement followed by 3-4 points.
- Use lots of examples from the course material to prove your points. Generally speaking the more you write the better!
- Write a conclusion (a few statements that tie in your thesis and supporting points).



Math, Science and Tech Exams:

- Show all your work, it will get you part marks
- Look at your final answer and see if it's reasonable
- When studying, go through past homework assignments, tests and your textbook and copy out problems. Mix them up and solve as many as possible.

(courtesy of Richmond Hill High School Math Department)

FRACTIONS

(adapted from **501 Math Problems**)

MULTIPLE CHOICE: Choose the **ONE BEST** answer to each question.

- 1) Larry spends $\frac{3}{4}$ hour twice a day walking and playing with his dog. He also spends $\frac{1}{6}$ hour twice a day feeding his dog. How much time does Larry spend on his dog each day?
 - A) $\frac{11}{12}$ hour
 - B) $1\frac{1}{2}$ hour
 - C) $1\frac{5}{6}$ hour
 - D) $1\frac{2}{5}$ hour
- 2) The first section of a newspaper has 16 pages. Advertisements take up $3\frac{3}{8}$ of the pages. How many pages are not advertisements?
 - A) $12\frac{5}{8}$
 - B) $19\frac{3}{8}$
 - C) 13
 - D) $12\frac{1}{2}$
- 3) Joe walked $2\frac{1}{2}$ kilometers to school, $\frac{1}{3}$ kilometers to work and $1\frac{1}{4}$ kilometers to his friend's house. How many kilometers did Joe walk altogether?
 - A) $3\frac{1}{9}$
 - B) $4\frac{1}{12}$
 - C) $4\frac{1}{9}$
 - D) 4
- 4) Justin read $\frac{1}{8}$ of a book the first day, $\frac{1}{3}$ the second day and $\frac{1}{4}$ the third day. On the fourth day, he finished the book. What part of the book did Justin read on the fourth day?
 - A) $\frac{2}{5}$
 - B) $\frac{3}{8}$
 - C) $\frac{7}{24}$
 - D) $\frac{17}{24}$
- 5) Tammi babysat for $4\frac{1}{2}$ hours. She charged \$7 an hour. How much should she get paid?
 - A) \$28.50
 - B) \$35
 - C) \$28
 - D) \$31.50
- 6) Which of the fractions below is greater than $1\frac{1}{2}$?
 - A) $\frac{7}{5}$
 - B) $\frac{31}{20}$
 - C) $\frac{28}{20}$
 - D) $\frac{14}{11}$
- 7) Memo Television has six minutes of advertising space every 15 minutes. How many $\frac{3}{4}$ minute commercials can they fit in the six-minute block?
 - A) $4\frac{1}{2}$
 - B) 8
 - C) 20
 - D) 11

- 8) Darma travelled 12 hours to visit her grandmother; she spent $\frac{5}{6}$ of her travel time on the highway. How many hours were not spent on the highway?

A) 3 hours
B) $4\frac{1}{3}$ hours
C) $1\frac{1}{6}$ hours
D) 2 hours

- 9) A rectangular garden is $4\frac{1}{2}$ meters by 3 meters. How many meters of fence are needed to surround the garden?

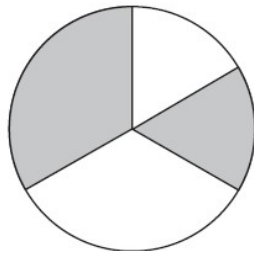
A) $16\frac{1}{2}$
B) $7\frac{1}{2}$
C) 15
D) 14

- 10) Lucy worked $32\frac{1}{2}$ hours last week and earned \$195. What is her hourly wage?

A) \$7.35
B) \$5.00
C) \$6.09
D) \$6.00

- 11) What fraction of the circle below is shaded?

A) $\frac{2}{3}$
B) $\frac{1}{2}$
C) $\frac{5}{6}$
D) $\frac{1}{3}$



- 12) Which of the following is **NOT** equivalent to $\frac{3}{5}$?

A) $\frac{6}{15}$
B) 0.6
C) $\frac{15}{25}$
D) 60%

FRACTIONS

(various sources)

13) Identify which of the following are improper fractions:

A) $\frac{21}{2}$

B) $\frac{1}{2}$

C) $\frac{83}{112}$

D) $\frac{5}{4}$

14) Change the mixed numbers to improper fractions:

a) $2\frac{4}{5}$

b) $6\frac{11}{17}$

c) $87\frac{41}{69}$

15) Change improper fractions to mixed numbers:

a) $\frac{10}{7}$

b) $\frac{132}{11}$

c) $\frac{94}{93}$

16) Simplify the following fractions or expressions.

Write the fractions in lowest terms.

a) $\frac{15}{25}$

b) $\frac{35}{42}$

c) $\frac{36}{12}$

d) $\frac{12}{17} + \frac{3}{17}$

e) $\frac{1}{2} + \frac{2}{3}$

f) $\frac{8}{11} - \frac{5}{11}$

g) $\frac{47}{50} - \frac{3}{10}$

h) $3\frac{7}{8} + 1\frac{5}{8}$

i) $2\frac{3}{5} + \frac{9}{10}$

j) $2\frac{2}{3} - \frac{1}{3}$

k) $10 - 3\frac{2}{3}$

l) $\frac{5}{9} \times \frac{3}{10}$

m) $\left(2\frac{1}{2}\right) \times \left(3\frac{1}{5}\right)$

n) $\frac{4}{5} \div \frac{1}{2}$

o) $3\frac{4}{5} \div 1\frac{2}{15}$

PERCENTS

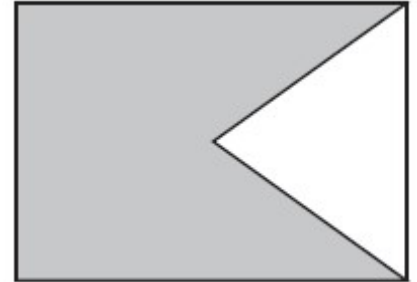
(adapted from **501 Math Problems**)

MULTIPLE CHOICE: Choose the **ONE BEST** answer to each question.

- 1) A pair of pants costs \$24. The cost was reduced by 8%. What is the new cost of the pants?
 A) \$25.92
 B) \$21.06
 C) \$22.08
 D) \$16.00
- 2) Claire purchased a frying pan that was on sale for 30% off. She saved \$3.75 with the sale. What was the original price of the frying pan?
 A) \$10.90
 B) \$9.25
 C) \$12.50
 D) \$11.25
- 3) Nick paid \$68.25 for a coat, including sales tax of 5%. What was the original price of the coat before tax?
 A) \$63.25
 B) \$65.25
 C) \$65.00
 D) \$64.84
- 4) A tent originally sold for \$260 and has been marked down to \$208. What is the percent of discount?
 A) 20%
 B) 25%
 C) 52%
 D) 18%
- 5) Christie purchased a scarf marked \$15.50 and gloves marked \$5.50. Both items were on sale for 20% off the marked price. Christie paid 5% sales tax on her purchase. How much did she spend?
 A) \$25.20
 B) \$16.80
 C) \$26.46
 D) \$17.64

- 6) What percent of the figure below is shaded?

- A) 50%
- B) 65%
- C) 75%
- D) 80%



- 7) Melissa and Jennifer threw a 50th birthday party for their father at a local restaurant. When the bill came, Melissa added 15% tip of \$42. Jennifer said that the service was wonderful and they should leave a 20% tip instead. How much is a 20% tip?
 A) \$56
 B) \$45
 C) \$47
 D) \$60
- 8) Memo Oil gives customers a 5% discount if they pay their bill within 10 days. The Charles' oil bill is \$178. How much do they save if they pay the bill within 10 days?
 A) \$8.90
 B) \$5.00
 C) \$17.80
 D) \$14.60

PERCENTS

(various sources)

- 9) Find the equivalent fraction (in lowest terms) to the following decimal expressions.
 - a) 0.3
 - b) 0.5
 - c) 3.2
 - d) 18.25

ALGEBRA(adapted from **501 Math Problems**)**MULTIPLE CHOICE:** Choose the **ONE BEST** answer to each question.

- | | |
|---|--|
| <p>1) A long distance call costs x cents for the first minute and y cents for each additional minute. How much would a five minute call cost?</p> <p>A) $5xy$</p> <p>B) $x + 5y$</p> <p>C) $\frac{xy}{5}$</p> <p>D) $x + 4y$</p> <p>2) Sally gets paid x dollars per hour for a 40 hour work week and y dollars for each hour she works over 40 hours. How much did Sally earn if she worked 48 hours?</p> <p>A) $48xy$</p> <p>B) $40y + 8x$</p> <p>C) $40x + 8y$</p> <p>D) $48x + 48y$</p> <p>3) If twice the quantity $x + 6$ is divided by negative four, the result is 5. Find the number.</p> <p>A) -18</p> <p>B) -16</p> <p>C) -13</p> <p>D) -0.5</p> <p>4) The perimeter of a square can be expressed as $x + 4$. If one side of the square is 24, then what is the value of x?</p> <p>A) 2</p> <p>B) 7</p> <p>C) 5</p> <p>D) 92</p> <p>5) The perimeter of a rectangle is 21 cm. What is the measure of its width if its length is 3 cm greater than its width?</p> <p>A) 9</p> <p>B) 3.75</p> <p>C) 4.5</p> <p>D) 3</p> | <p>6) The sum of two consecutive odd integers is -112. What is the larger integer?</p> <p>A) -55</p> <p>B) -57</p> <p>C) 55</p> <p>D) 57</p> <p>7) Two commuters leave the same city at the same time but travel in opposite directions. One car is traveling at an average speed of 63 kilometers per hour, and the other car is traveling at an average speed of 59 kilometers per hour. How many hours will it take before the cars are 610 kilometers apart?</p> <p>A) 4</p> <p>B) 6</p> <p>C) 30</p> <p>D) 5</p> <p>8) One integer is four times another. The sum of the integers is 5. What is the value of the lesser integer?</p> <p>A) 5</p> <p>B) 4</p> <p>C) 2</p> <p>D) 1</p> |
|---|--|
-
- ALGEBRA**

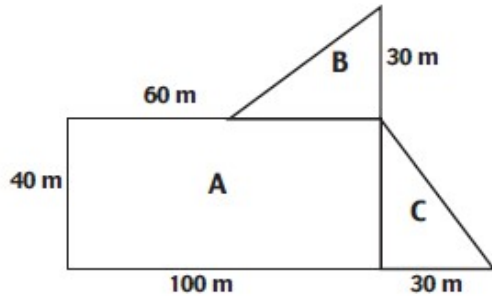
(various sources)
- | | |
|--|---|
| <p>9) Solve for x.</p> <p>a) $x - 5 = -2$</p> <p>b) $1.7x = 6.8$</p> <p>c) $8x - 2 = 4 + 5x$</p> <p>d) $2(3x + 4) = x + 6$</p> <p>e) $7x + 3x - (10x + 2) = 5 + x$</p> | <p>10) Harold has typed 14 more pages than Johanna. Together they have typed a total of 138 pages. How many pages have each of them typed?</p> <p>11) The sum of three consecutive whole numbers is 72. What are the three numbers?</p> |
|--|---|

GEOMETRY

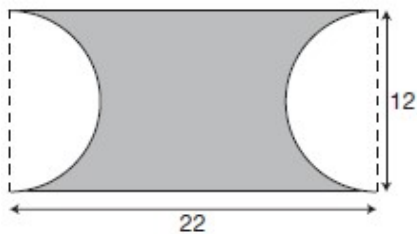
(adapted from **501 Math Problems**)

MULTIPLE CHOICE: Choose the **ONE BEST** answer to each question.

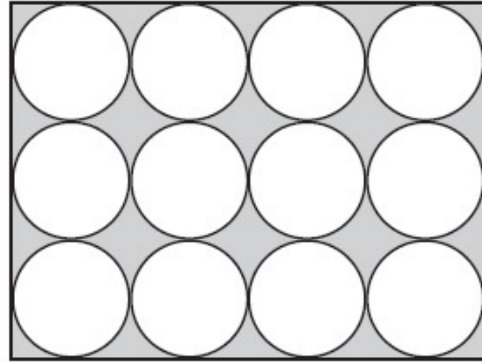
- 1) Consider the diagram below. Find the perimeter of the plot of land.



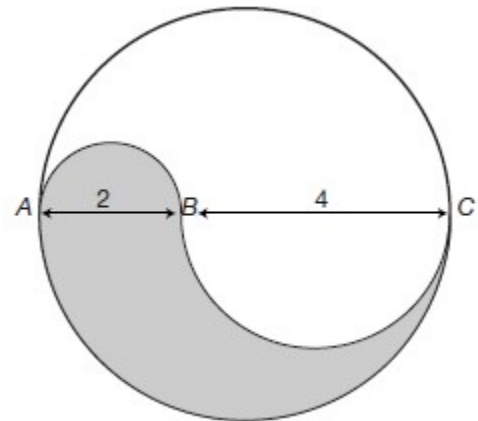
- A) 260 m
B) 340 m
C) 360 m
D) 320 m
- 2) Two angles are supplementary. The measure of one is 30° more than twice the measure of the other. Find the measure of the larger angle.
- A) 130°
B) 20°
C) 50°
D) 70°
- 3) The measures of the angles of a triangle are in the ratio of 3:4:5. Find the measure of the largest angle.
- A) 75°
B) 37.5°
C) 45°
D) 60°
- 4) Using the illustration provided, find the area of the shaded region in terms of π .



- 5) Find the total area of the shaded regions, if the radius of each circle is 5 cm. Leave your answer in terms of π .



- A) $1200 - 300\pi$
B) $300 - 300\pi$
C) $300\pi - 1200$
D) $300\pi - 300$
- 6) Find the area of the shaded region. Leave your answer in terms of π .



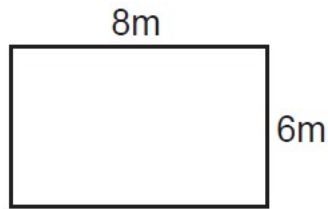
- A) $264 - 18\pi$
B) $264 - 36\pi$
C) $264 - 12\pi$
D) $18\pi - 264$

- A) 16.5π
B) 30π
C) 3π
D) 7.5π

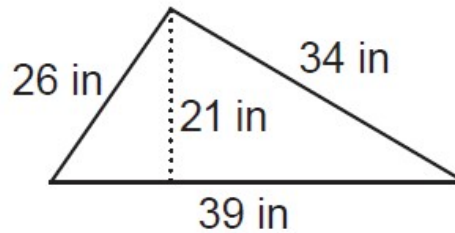
GEOMETRY

(various sources)

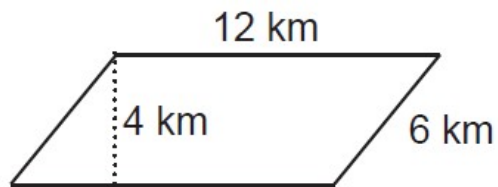
- 7) Find the perimeter and area of the rectangle below.



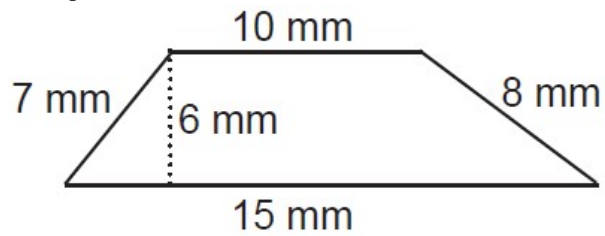
- 8) Find the perimeter and area of the triangle below.



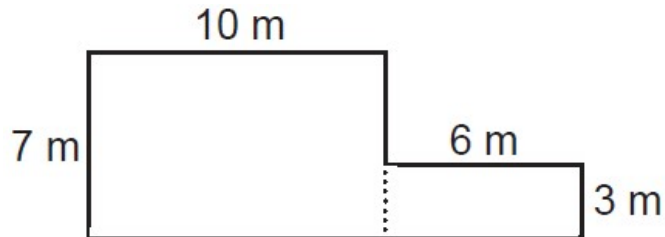
- 9) Find the perimeter and area of the parallelogram below.



- 10) Find the perimeter and area of the trapezoid below.



- 11) Find the perimeter and area of the polygon below.



RATES & LINEAR RELATIONS

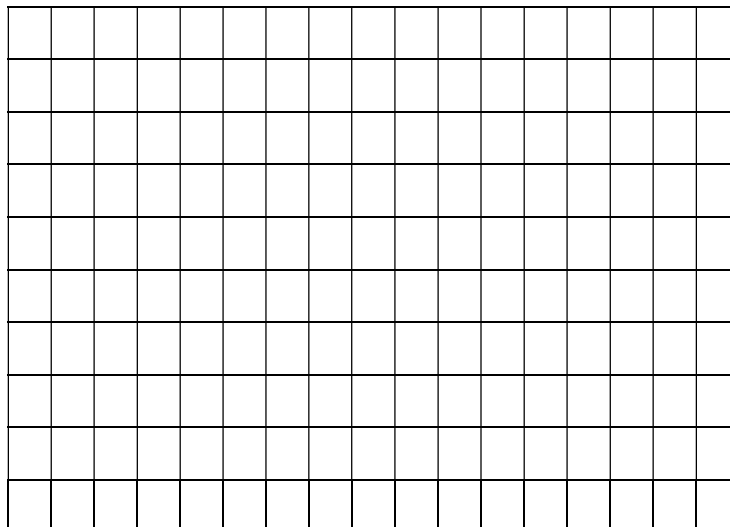
(various sources)

- 1) Calculate each unit rate.
 - a) A printer prints 34 pages in four minutes.
 - b) Dog food costs \$16 for a 4 kg bag.
 - c) A car travelled 1250 km in 15 hours.
 - d) A breakfast cereal costs \$3.50 for 650 grams.
 - e) A recipe calls for 750 mL of flour to make 30 banana muffins.

- 2) John makes house calls to repair home computers. The following is a partial list of his repair charges.

Labour(hours)	Repair costs(\$)
1	120
2	160
3	200

- a) Using the grid below, graph the relation. Note: The horizontal axis (independent variable) is time and the vertical axis (dependent variable) is repair cost.
- b) Identify the pattern in the above table and use it to find how many hours are required if the repair cost was \$360.
- c) If x represents the number of hours worked and y represents the repair costs, then find an equation relating cost to hours worked.
- d) Identify the coordinates of the point where the relation crosses the vertical (y – axis). Explain the significance of this point.



MISCELLANEOUS MATH(adapted from **501 Math Problems**)**MULTIPLE CHOICE:** Choose the **ONE BEST** answer to each question.

- 1) Oscar sold 2 glasses of milk for every 5 sodas he sold. If he sold 10 glasses of milk, how many sodas did he sell?
A) 45
B) 20
C) 25
D) 10
- 2) Justin earned scores of 85, 92 and 95 on his science tests. What does he need to earn on his next science test to have an average (arithmetic mean) of 93%?
A) 93
B) 100
C) 85
D) 96
- 3) Brad's class collected 320 cans of food. They boxed them in boxes of 40 cans each. How many boxes did they need?
A) 280
B) 10
C) 8
D) 5
- 4) Which expression has an answer of 18?
A) $2 \times 5 + 4$
B) $2 \times (5 + 4)$
C) $5 \times (2 + 4)$
D) $4 \times 2 + 5$
- 5) Susan travelled 114 kilometers in 2 hours. If she keeps going at the same rate, how long will it take her to go the remaining 285 kilometers of her trip?
A) 5 hours
B) 3 hours
C) 7 hours
D) 4 hours
- 6) A flight from Pittsburgh to Los Angeles took 5 hours and covered 3,060 kilometers. What was the plane's average speed?
A) 545 kph
B) 615 kph
C) 515 kph
D) 612 kph
- 7) The temperature at 6 p.m. was 31°C . By midnight, it had dropped by 40°C . What was the temperature at midnight?
A) 9°C
B) -9°C
C) -11°C
D) 0°C
- 8) The total ticket sales for a soccer game were \$1260 with 210 tickets being sold. If all the tickets are the same price, what was the cost of a ticket?
A) \$6.00
B) \$3.50
C) \$10.00
D) \$7.50
- 9) Lance has 70 cents, Margaret has three-fourths of a dollar, Guy has two quarters and a dime, and Bill has six dimes. Who has the most money?
A) Lance
B) Margaret
C) Guy
D) Bill
- 10) The students at York Memorial were asked to name their favorite type of pet. Of the 430 students surveyed, 258 said that their favorite type of pet was a dog. Suppose that only 100 students were surveyed, with similar results, about how many students would say that a dog is their favorite type of pet?
A) 58
B) 60
C) 72
D) 46

- 11) A large pipe dispenses 750 litres of water in 50 seconds. At this rate, how long will it take to dispense 330 litres?
- A) 14 seconds
 - B) 33 seconds
 - C) 22 seconds
 - D) 27 seconds
- 12) Which expression below is equal to 5?
- A) $(1+2)^2$
 - B) $9-2^2$
 - C) $11-10 \times 5$
 - D) $45 \div 3 \times 3$
- 13) A bus picks up a group of tourists at a hotel. The sightseeing bus travels 2 blocks north, 2 blocks east, 1 block south, 2 blocks east and 1 block south. Where is the bus in relation to the hotel?
- A) 2 blocks north
 - B) 1 block west
 - C) 3 blocks south
 - D) 4 blocks east
- 14) The ratio of boys to girls at the dance was 3:4. There were 60 girls at the dance. How many boys were at the dance?
- A) 45
 - B) 50
 - C) 55
 - D) 40

ANSWERS

Fractions

- 1) C
 2) A
 3) B
 4) C
 5) D
 6) B
 7) B
 8) D
 9) C
 10) D
 11) B
 12) A
 13) A & D
 14)
 a) $\frac{14}{5}$
 b) $\frac{113}{17}$
 c) $\frac{6044}{69}$
 15)
 a) $1\frac{3}{7}$
 b) 12
 c) $1\frac{1}{93}$
 16)
 a) $\frac{3}{5}$
 b) $\frac{5}{6}$
 c) 3
 d) $\frac{15}{17}$
 e) $1\frac{1}{6}$
 f) $\frac{3}{11}$
 g) $\frac{16}{25}$
 h) $5\frac{1}{2}$
 i) $3\frac{1}{2}$

- j) $2\frac{1}{3}$
 k) $6\frac{1}{3}$
 l) $\frac{1}{6}$
 m) 8
 n) $1\frac{3}{5}$
 o) $3\frac{6}{17}$

Percents

- 1) C
 2) C
 3) C
 4) A
 5) D
 6) C
 7) A
 8) A
 9)
 a) $\frac{3}{10}$
 b) $\frac{1}{2}$
 c) $3\frac{1}{5}$
 d) $18\frac{1}{4}$

Algebra

- 1) D
 2) C
 3) B
 4) D
 5) B
 6) A
 7) D
 8) D

9)

- a) $x = 3$
 b) $x = 4$
 c) $x = 2$
 d) $x = -\frac{2}{5}$
 e) $x = -7$

- 10) Johanna typed 62 pages; Harold typed 76 pages
 11) 23, 24, 25

Geometry

- 1) C
 2) A
 3) A
 4) B
 5) A
 6) C
 7) $P = 28 \text{ m}$;
 $A = 48 \text{ m}^2$
 8) $P = 99 \text{ inches}$;
 $A = 409.5 \text{ inches}^2$
 9) $P = 36 \text{ km}$;
 $A = 48 \text{ km}^2$
 10) $P = 40 \text{ mm}$;
 $A = 75 \text{ mm}^2$
 11) $P = 46 \text{ m}$;
 $A = 88 \text{ m}^2$

Rates & Linear Relations

- 1)
 a) 8.5 pages per minute
 b) \$4 per kilogram
 c) 83.3 km/hour
 d) 0.54¢ per gram
 e) 25 mL per muffin

2)

- a) ---
 b) For every hour, the cost increases by \$40; at 7 hours, the cost will be \$360.
 c) $y = 40x + 80$
 d) (0,80); for no hours worked, there is a consultation fee of \$80.

Miscellaneous Math

- 1) C
 2) B
 3) C
 4) B
 5) A
 6) D
 7) B
 8) A
 9) B
 10) B
 11) C
 12) B
 13) D
 14) A