

Diagnostic Test

Student Name:
Test Date:

Start Time:
End Time:

Part A

Here are some reminders for when you are taking the multiple-choice section.



- Carefully read each problem before choosing an answer.
- Be sure to choose only one answer for each problem.
- Do not spend too much time on any one problem. If you are having difficulty with a problem, skip it and move on to the next problem.
- You can come back to the skipped problem later if you have time.

1. Which of the following formulas can be used to find the area of a circle?

- Ⓐ $C = \pi \cdot d$
- Ⓑ $C = 2(\pi)r$
- Ⓒ $A = (\pi)r^2$
- Ⓓ $D = C/(\pi)$

2. Danny rolls two number cubes (dice), one red and one blue. What is the probability that he will roll a 2 on the red cube and a 6 on the blue cube?

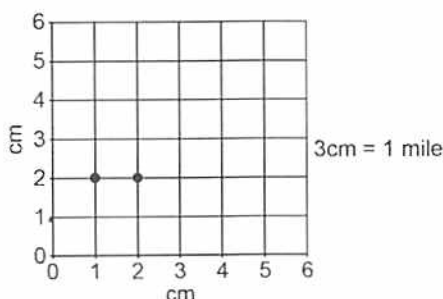
- Ⓐ $\frac{1}{6}$
- Ⓑ $\frac{2}{15}$
- Ⓒ $\frac{1}{18}$
- Ⓓ $\frac{1}{36}$



3. A student at a large middle school is planning to survey students about their favorite cafeteria meal. Which of the following would ensure the survey is valid?

- Ⓐ choose a sample that represents the student population
- Ⓑ only ask friends about their food choices
- Ⓒ only ask students about your favorite foods
- Ⓓ only ask sixth graders to participate in the survey

4. The figure is drawn such that $3\text{cm} = 1\text{ mile}$



What is the distance one would travel between these two locations?

- Ⓐ 1 mile
 - Ⓑ 3 miles
 - Ⓒ $\frac{1}{3}$ of a mile
 - Ⓓ This cannot be determined
5. An architect is planning a triangular pool with a perimeter of 99 ft. If two of the sides measure 20 and 42, respectively, what is the length of the missing side?
- Ⓐ 35 feet
 - Ⓑ 37 feet
 - Ⓒ 39 feet
 - Ⓓ 41 feet
6. You've been given a scholarship of \$10,000. If you invest it at a 3.4% annual interest rate, how much interest will you have earned in a year's time?
- Ⓐ \$34,000
 - Ⓑ \$340
 - Ⓒ \$10,340
 - Ⓓ \$10,000

7. Simplify the following expression:

$$4(x + 3) + (7 - 4)$$

- (A) $15x$
- (B) $7x + 13$
- (C) $4x + 15$
- (D) $12x + 3$

8. Jasmin takes three walks a day. If her walks last 30 minutes, 47 minutes, and 1 hour, respectively, and she walks a total of 4 miles a day, which of the following reflects the approximate pace she walks?

- (A) two and a quarter miles per hour
- (B) two and a half miles per hour
- (C) one half mile per hour
- (D) one quarter mile per hour

9. Examine the chart:

Days of the Week	Total students not in uniform	# boys not in uniform	# girls not in uniform	Temperature	# students tardy
Monday	27	17	10	72	12
Tuesday	42	14	28	87	9
Wednesday	23	7	16	81	14
Thursday	26	15	11	78	10
Friday	22	13	9	77	11

Which of the following statements is true based on the information in the chart?

- (A) The same students are tardy each day.
- (B) Each day more boys did not wear their uniform compared to girls.
- (C) On the hottest days, most girls did not wear their uniform.
- (D) There are more boys not in uniform than girls during the week.

10. Evaluate if $a = 4$, $b = 6$, $c = -3$.

$$5ab \div c$$

- (A) 108
- (B) 40
- (C) -40
- (D) 33



11. A restaurant owner spends \$892 for 65 pounds of produce. Which equation could you use to find the price per pound?
- Ⓐ $892(65) = x$
 - Ⓑ $892 = 65 / x$
 - Ⓒ $892 = 65x$
 - Ⓓ $892 = 65 + x$
12. As a mixed number, 240% is equal to _____ .
- Ⓐ 24
 - Ⓑ 240
 - Ⓒ $2\frac{4}{5}$
 - Ⓓ $2\frac{2}{5}$
13. Roger wraps presents at a local gift shop. If it takes 1.4 meters of ribbon to wrap a present, how many can he wrap if he has 40 meters of ribbon?
- Ⓐ 27
 - Ⓑ 28
 - Ⓒ 29
 - Ⓓ 30
14. A table top is in the shape of an equilateral triangle. If the perimeter of the table top is 420 cm, what is the length of one side of the table?
- Ⓐ 140 cm
 - Ⓑ 180 cm
 - Ⓒ 35 cm
 - Ⓓ 105 cm
15. In 1954, Great Britain's Diane Leather was the first to break the 5-minute mile in woman's track and field. Assuming she ran at a constant speed, if her time for the mile was 4:59.6, what would her time have been at the half-mile mark?
- Ⓐ 2:30.3
 - Ⓑ 2:29.8
 - Ⓒ 9:59.2
 - Ⓓ 8:30.6

Questions 16 and 17 are short constructed response questions.

- Carefully read each problem before writing your answer.

16. The distance from the outer edge to the center of a circular garden is 4.6m. What is the area of the garden?

17. A shirt, which regularly sells for \$34.99, is on sale for 20% off. What is the sale price of the shirt?



Extended Constructed Response 1

Here are some reminders for when you are completing this Extended Constructed Response task.

- Carefully read each part of the task before writing your response.
- Be sure to complete all parts of the task.
- Clearly explain your answer and show all your work.
- Your explanation can include words, tables, diagrams, or pictures.

The middle school band is planning to sell frozen pizzas for a fund raiser. The pizzas come in 3 sizes – small, medium, and large. The small pizzas are sold for \$5.00. The medium pizzas are sold for \$8.00. The large pizzas are sold for \$10.00. The school band keeps 40% of the money collected. The rest is sent to the company to cover the cost of the pizzas.

Use the information above to complete the following:

Write an equation that could be used to calculate the total money raised (after the expenses are paid), if (s) small, (m) medium, and (l) large pizzas are sold.

Find a combination of small, medium, and large pizzas that would raise between \$150 and \$200 for the band (after expenses.) Include at least 5 of each size of pizza in your combination.

Part B

Here are some reminders for when you are taking the multiple-choice section.



- Carefully read each problem before choosing an answer.
- Be sure to choose only one answer for each problem.
- Do not spend too much time on any one problem. If you are having difficulty with a problem, skip it and move on to the next problem.
- You can come back to the skipped problem later if you have time.

18. Simplify the following expression:

$$10(2 + 3) - 8 \cdot 3$$

- (A) 126
- (B) 74
- (C) 26
- (D) 18

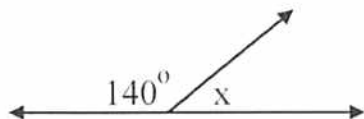
19. $x^6 \cdot x^{10} =$

- (A) x^{60}
- (B) x^{30}
- (C) x^{16}
- (D) x^{-4}

20. A rectangular garden has an area of 432 square feet. The length of the garden is 24 feet. What is the width of the garden?

- (A) 20 feet
- (B) 18 feet
- (C) 24 feet
- (D) It cannot be determined.

21. Find the value of x (in degrees).



- (A) 20°
- (B) 40°
- (C) 60°
- (D) 120°

22. If Ron walks $\frac{1}{2}$ mile in a quarter of an hour and Maria walks $\frac{1}{3}$ mile in the same time period, how many miles have Ron and Maria walked in 3 hours?

- Ⓐ $1 \frac{1}{3}$ miles
- Ⓑ 4 miles
- Ⓒ 6 miles
- Ⓓ 10 miles

23. Solve for x .

$$\frac{48}{144} = \frac{27}{x}$$

- Ⓐ $x = 9$
- Ⓑ $x = 36$
- Ⓒ $x = 54$
- Ⓓ $x = 81$

24. Simplify this expression.

$$4(8x + 3) + 3(2x + 6)$$

- Ⓐ $36x + 6$
- Ⓑ $38x + 30$
- Ⓒ $44x + 36x$
- Ⓓ $80x$

25. A student draws a tree using a scale of $2 \text{ cm} = 4 \text{ feet}$. Find the actual height of the tree if the image measures 5.6 cm tall.

- Ⓐ 22.4 feet
- Ⓑ 11.2 feet
- Ⓒ 44.8 feet
- Ⓓ 2.8 feet

26. A bill for \$57.62 arrives after a particularly nice meal. How much should you charge to your credit card if you want to leave a 20% tip?

- Ⓐ \$69.14
- Ⓑ \$11.52
- Ⓒ \$63.38
- Ⓓ \$5.76



27. You are going to a movie, and your friend says it is showing some time on the weekend between noon and 8, but won't say when, exactly.

What are the chances it is playing on Sunday between 6 and 8?

- Ⓐ 12.5%
- Ⓑ 25%
- Ⓒ 37.5%
- Ⓓ 50%

Questions 28 and 29 are short constructed response questions.

- Carefully read each problem before writing your answer.

28. The ratio (by volume) of sand to peat moss in a certain sample of soil is 2 to 7. If the total volume of the soil is 180 cubic feet, what is the volume of sand in the soil (in cubic feet)?

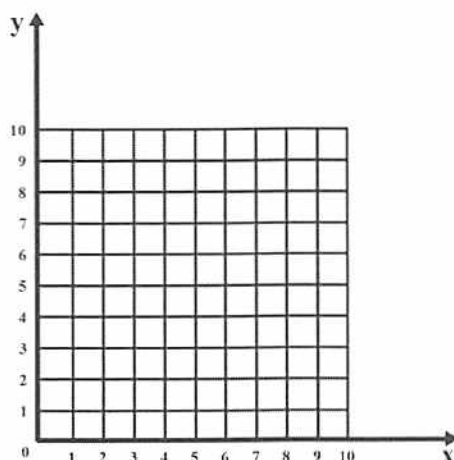
29. What is the surface area of a cube with a side length of 9?



Extended Constructed Response 2

Here are some reminders for when you are completing this Extended Constructed Response task.

- Carefully read each part of the task before writing your response.
- Be sure to complete all parts of the task.
- Clearly explain your answer and show all your work.
- Your explanation can include words, tables, diagrams, or pictures.
- You may use a calculator and a ruler for this task.



Use the grid to complete the following:

Plot the following points:

Draw $\triangle ABC$.

Find the area of triangle $\triangle ABC$. A: (0, 0) B: (4, 0) C: (3, 4)

Draw a rectangle, named $GHIJ$, with an area approximately three times smaller than the area of the triangle. Explain your reasoning.

Part C

Here are some reminders for when you are taking the multiple-choice section.

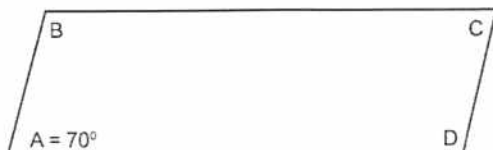


- Carefully read each problem before choosing an answer.
- Be sure to choose only one answer for each problem.
- Do not spend too much time on any one problem. If you are having difficulty with a problem, skip it and move on to the next problem.
- You can come back to the skipped problem later if you have time.

30. Current sales tax is 9.25%. You take a friend out for a bowl of pasta (\$12), a pizza (\$17.50) and two sodas (\$2.25 each). How much will the total bill be after sales tax?

- Ⓐ \$37.15
- Ⓑ \$35.50
- Ⓒ \$34
- Ⓓ \$3.14

31. A parallelogram has the following measurements:



Which of the following can be determined based on the information provided?

- Ⓐ Angle C measures 70 degrees.
 - Ⓑ Angle B measures less than 70 degrees.
 - Ⓒ Angle D measures less than 70 degrees.
 - Ⓓ Angles A and C together measure 180 degrees.
32. Joseph weighs 140 lbs. He goes on a diet for four weeks and loses three pounds per week. After those four weeks, he starts to gain back one pound a week for the next three weeks. What is his final weight after those seven weeks?
- Ⓐ 125 lb
 - Ⓑ 138 lb
 - Ⓒ 135 lb
 - Ⓓ 131 lb

33. Joel rolls two dice at the same time. What is the probability that he will roll a sum of eleven?

(A) $\frac{2}{24}$

(B) $\frac{1}{18}$

(C) $\frac{11}{36}$

(D) $\frac{1}{6}$

34. Simplify. $4(8x - 2)$

(A) $32x + 8$

(B) $24x$

(C) $32x - 8$

(D) $40x$

35. 30 ping pong balls have been painted in 5 different colors: red, black, blue, green, and yellow. Each color is represented equally and all of the ping pong balls are placed into a black pouch. If you reach into the bag and pull out one ball, what is the probability that you will pull out a blue or a green ball on your first try?

(A) $\frac{1}{3}$

(B) $\frac{1}{6}$

(C) $\frac{2}{5}$

(D) $\frac{2}{6}$



36. Seven-tenths of group A prefer chocolate to vanilla ice cream. Four-tenths of group B prefer chocolate to vanilla ice cream. Groups A and B have an equal number of members. If groups A and B were combined, what fraction of the new group would prefer chocolate to vanilla?

(A) $\frac{3}{10}$

(B) $\frac{28}{100}$

(C) $\frac{11}{20}$

(D) $\frac{4}{7}$

37. There are three quarters, two dimes, a nickel, and a penny in a jar. If one coin is chosen at random, what is the probability that it will be a dime or a penny?

(A) $\frac{1}{7}$

(B) $\frac{2}{7}$

(C) $\frac{3}{7}$

(D) $\frac{4}{7}$

38. How much water will fill a pool shaped as a triangular prism given its length is 13m, a height of 6m and base of 2m?

(A) 78 m^3

(B) 156 m^3

(C) 21 m^3

(D) 19 m^3

39. A landscape architect wants to build a raised garden that measures 6 meter long, 2.5 meters wide and 0.5 meters tall. How much potting soil will be needed to fill the garden bed?

(A) 9 cubic meters

(B) 7.5 cubic meters

(C) 17.5 cubic meters

(D) 18 cubic meters

Questions 40 and 41 are short constructed response questions.

- Carefully read each problem before writing your answer.

40. If you have \$1,500 to invest for 3 years, which situation will make you more money on your investment - simple interest at 8% or quarterly compounded interest at 5%? Explain your answer with reasoning.

41. Alex has \$25 in his savings account. He needs \$150 to buy a new bicycle. He plans to deposit \$12.50 per week into the account until he has enough money to buy the bicycle. How many weeks will it take him to reach the necessary amount?

Extended Constructed Response 3

Here are some reminders for when you are completing this Extended Constructed Response task.

- Carefully read each part of the task before writing your response.
- Be sure to complete all parts of the task.
- Clearly explain your answer and show all your work.
- Your explanation can include words, tables, diagrams, or pictures.
- You may use a calculator and a ruler for this task.

Six students have entered a chess competition. Each participant will play every other participant exactly once. How many games will have to be played in the competition? Be sure to clearly explain how you arrived at your answer.

On the day of the competition, one of the players does not show up. How many fewer games will be played, now that there is one less person in the competition?