Mathematical Reasoning

(Non-Calculator)

5 questions
10 minutes*

You may not use a calculator on this section.

*Test-takers are advised to pace themselves by spending no more than 10 to 12 minutes on the non-calculator portion of the Mathematical Reasoning test so they can move on to the calculator-active portion.

Mathematics Formula Sheet

Area:

parallelogram	$A = bh$
trapezoid	$\frac{1}{2}h(b_1 + b_2)$

Surface Area and Volume:

rectangular/right prism:	SA = $ph + 2B$	$V = Bh$
cylinder:	SA = $2\pi rh + 2\pi r^2$	$V = \pi r^2 h$
pyramid:	SA = $\frac{1}{2}ps + B$	$V = \frac{1}{3}Bh$
cone:	SA = $\pi rl + \pi r^2$	$V = \frac{1}{3}\pi r^2 h$
sphere:	SA = $4\pi r^2$	$V = \frac{4}{3}\pi r^3$

(p = perimeter of base B; $\pi \approx 3.14$)

Algebra:

slope of a line: $m = \frac{y_2 - y_1}{x_2 - x_1}$

slope-intercept form of the equation of a line: $y = mx + b$

point-slope form of the equation of a line: $y - y_1 = m(x - x_1)$

standard form of a quadratic equation: $x = ax^2 + bx + c$

quadratic formula: $y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Pythagorean Theorem: $a^2 + b^2 = c^2$

simple interest: $I = prt$ (I = interest, p = principal, r = rate, t = time)

1. Convert 12 yards 3 feet and 8 inches into inches.

   A. 288

   B. 324

   C. 468

   D. 476

2. Twice a positive integer squared less 3 is 95. What is the integer? Place your answer in the box below.

   On the GED test, this would be a fill-in-the-blank question. Here, please select your answer from the choices given.

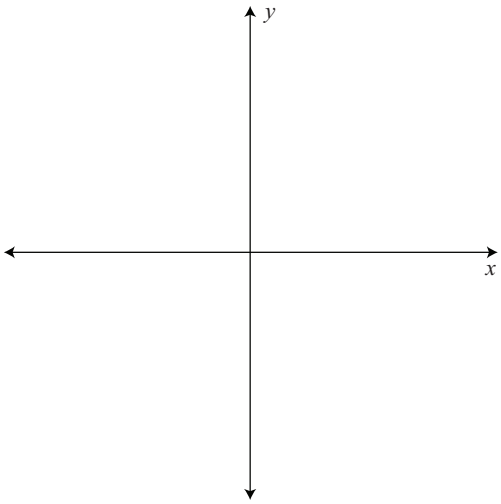
   A. 5

   B. 7

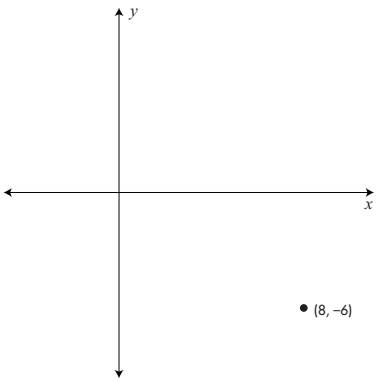
   C. 11

   D. 13

3. Place the point (8, –6) on the coordinate plane below. For the GED® test, this would be a hot-spot question. Here, we will have you choose among four sample coordinate planes.



A.



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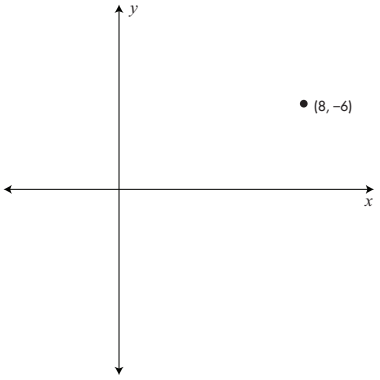
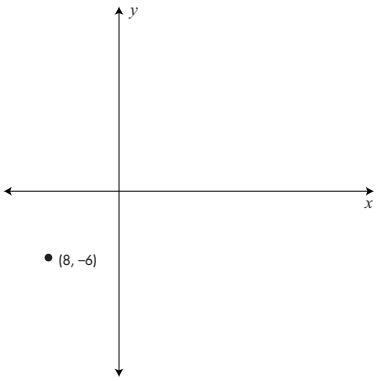
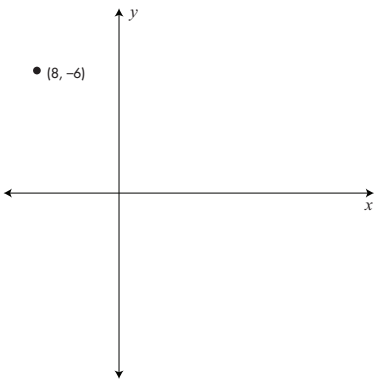


C.



D.



4. A jacket costing $120 is discounted 20%. After a week, the jacket is discounted another 20% and is sold. What expression below can be used to calculate the cost for which the jacket was sold?

   A. (120)(0.40)

   B. 120 – 120(0.40)

   C. 120 – (120)(.20) – [120 – (0.20)(120)](0.20)

   D. 120 – (120)(0.40) – [120 – (120)(0.40)]

5. Which of the following points lies on the line $y - 2 = 3(x - 4)$?

   A. (4, –2)

   B. (4, 2)

   C. (–4, –2)

   D. (6, –2)

Mathematical Reasoning

(Calculator)

45 questions
105 minutes*

You may use a calculator on this section.

*Timing is based on the total available time of 115 minutes for the Mathematical Reasoning test. Test-takers are advised to spend no more than 10 to 12 minutes on the non-calculator portion so they can invest more time on the more complex questions that show up in the calculator-active section that follows.

6. What is the diameter of a circle that has area equal to 484π? On the GED® test this might be a fill in the blank question. Here, just choose the correct answer choice.

   A. 22

   B. 30

   C. 44

   D. 54

7. Simplify the following expression.

$$\sqrt{12} + 3\sqrt{27} + \sqrt{3}$$

   A. 108

   B. $3\sqrt{42}$

   C. $12\sqrt{3}$

   D. $3\sqrt{3} + 3\sqrt{27}$

8. On the GED® test, this question could be a drop-down or cloze type. Here, please choose the lettered answer.

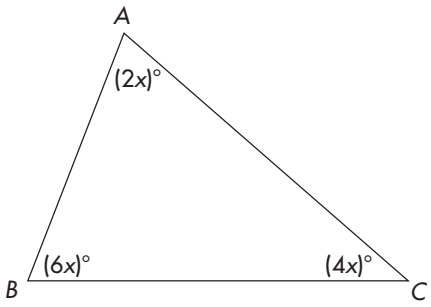
	less than	
$\sqrt{227}$	equal to	14.637
	greater than	

   A. less than

   B. equal to

   C. greater than

   D. /less than / equal to

9. 

   $\triangle ABC$ is what type of triangle?

   A. Obtuse

   B. Equiangular

   C. Isosceles

   D. Right

10. A 1.5 gallon jug needs to be filled with water. If the jug is filled one pint at a time, how many pints are needed to fill the jug?

    On the GED® test, this would be a fill-in-the-blank question. Here, please select your answer from the four provided.

    A. 10

    B. 12

    C. 14

    D. 15

11. Simplify the following expression.

$$5 - 2(3 - 5)^3 + 2^2 - (-11)$$

    This might be a fill-in-the blank question on the GED® test. Here, mark the correct answer.

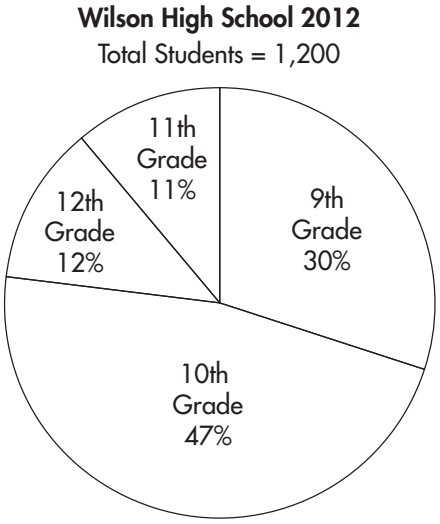
    A. 20

    B. 26

    C. 30

    D. 36

Questions 12 and 13 refer to the chart below.



12. The number of 9th graders attending the high school in 2014 is expected to be 20% greater than the 2012 total. How many 9th graders are expected to be at the high school in 2014? This could be another fill-in-the-blank question on the GED® test. Here choose the answer from the selection given.

    A. 422

    B. 432

    C. 660

    D. 900

13. What is the measure of the central angle created by the sum of the 9th and 11th graders?

    A. 147.6°

    B. 151.2°

    C. 163.7°

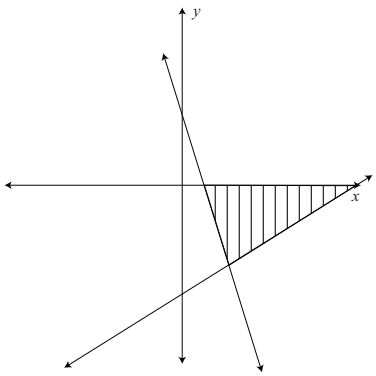
    D. 180°

14. Which of the following graphs represents the inequalities:

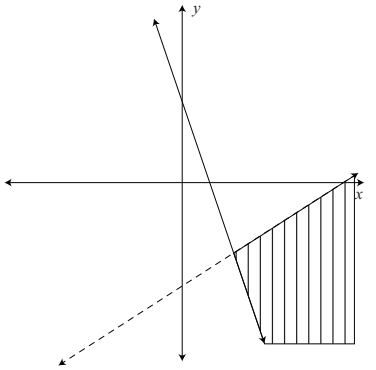
$$y < \frac{2}{3}x - 4$$

$$y \geq -3x + 3$$

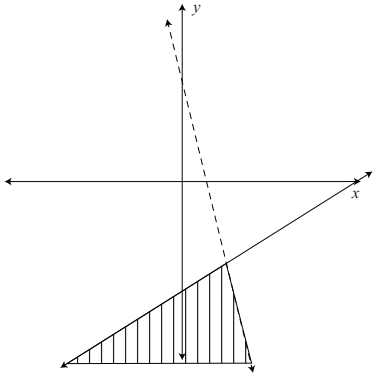
A.



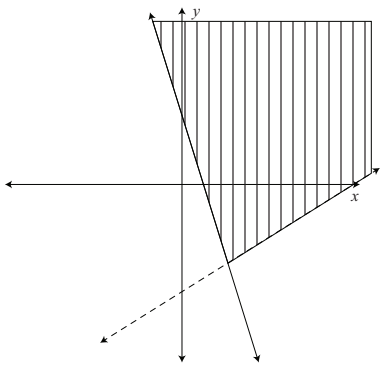
B.



C.



D.



15. A rectangular television screen is sold by the length of its diagonal. If the diagonal is 45″ and the height of the screen is 27″, what is the area of the screen?

    A. 972 in²

    B. 1,008 in²

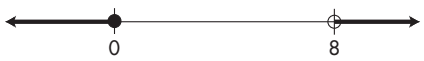
    C. 1,215 in²

    D. 1,620 in²

16. Which of the following graphs represents the compound inequality $-8 \leq 2x - 8 < 8$?

A.

B.



C.

D.

17. A board game uses a six-sided die and a spinner with the colors red, yellow and blue. What is the probability of throwing a 4 or 6 and spinning red or blue? This would be a drag-and-drop on the GED® test where you would place your answer in boxes provided below. For this test, select the correct answer from those given.

    A. $\frac{2}{3}$

    B. $\frac{1}{3}$

    C. $\frac{2}{9}$

    D. $\frac{1}{9}$

18. If $x^2 + 6x = 40$, what are the values of $x - 6$?

    A. 16, –2

    B. –16, –2

    C. 10, –4

    D. –20, 2

19. What is the slope of a line that is perpendicular to the line $2x - 7y = -37$? On the GED® test you would drag-and-drop the correct answer into the brackets. For now, simply select the answer choice from those listed.

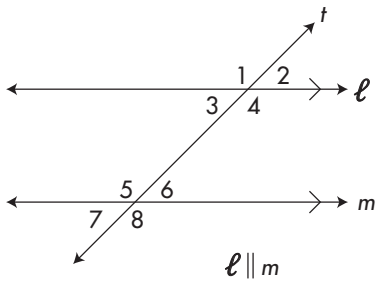
    A. $\frac{2}{7}$

    B. $\frac{-2}{7}$

    C. $\frac{7}{2}$

    D. $\frac{-7}{2}$

20.



If the measure of $\angle 5 = (3x)°$ and the measure of $\angle 2 = (2x)°$, what is the measure of $\angle 8$?

On the GED® test you would place your answer in the boxes below (ignoring the degree symbol). Here, select your answer from the choices given.

A. 98

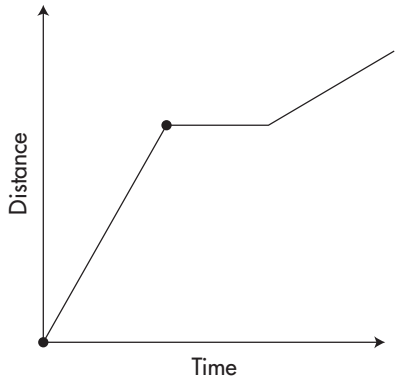
B. 102

C. 108

D. 110

21. Elena has an exercise routine in which she runs uphill, rests and bikes downhill (not in any set order).

The graph below shows her routine on a given day.



What is the order in which Elena rested, biked and ran?

A. ran, biked, rested

B. biked, rested, ran

C. rested, biked, ran

D. ran, rested, biked

22. The supplement of an angle is four times the measure of its complement. What is the measure of the angle?

Select the correct answer below.

the angle's measure is [less than / equal to / greater than] 60

This would be a Cloze example type on the GED® test. Here, simply select your answer from the choices given.

A. 35

B. 40

C. 55

D. 60

23. The following points lie on a certain line.

x	*y*
–2	–11
1	–5
4	1
6	5

What is the equation of the line?

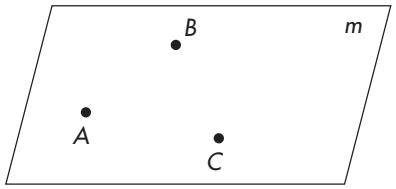
A. $y = -4x + 2$

B. $y = -3x + 3$

C. $y = 2x - 3$

D. $y = 2x - 7$

24.



In the figure above, points *A*, *B*, and *C* are

A. Collinear and coplanar

B. Collinear only

C. Non-collinear and coplanar

D. Adjacent and supplementary

25. What is the product of $(-2x^2y^3)^3(3xy^2)^2$?

A. $-6x^8y^{13}$

B. $-72x^7y^{10}$

C. $72x^7y^{10}$

D. $-72x^8y^{13}$

26. James placed $7,500 in a certificate of deposit (CD) at his local bank. The interest the CD generated was $731.25. If the interest rate was 6.5%, how many *months* was the money deposited?

A. 1.5

B. 2.5

C. 12

D. 18

27. A rectangle has a diagonal that is 5 inches long and a height of 1.4 inches. What is the perimeter of the rectangle? On the GED® test you would place your answer in the boxes below. Here make your selection from the choices provided.

A. 8.3

B. 10.6

C. 12.4

D. 14.8

28. What is the solution to the equation $x^2 + 4x - 14 = 0$? Round your answer to the nearest tenth.

A. 2.3

B. –6.3

C. 2.3, –6.3

D. 4.4, –4.1

29. Lori needs an 85% average in her math class to move on to the next class. On her first three exams, she earned scores of 81%, 78%, and 97%. What must Lori score on her fourth and final test to earn an 85% grade for the class? On the GED® test you would be directed to place your answer in the boxes below (ignoring the percent sign). Here, select from the choices given.

A. 84%

B. 86%

C. 92%

D. 96%

30. What is the perimeter of a square that has an area of 1,459.24 square meters?

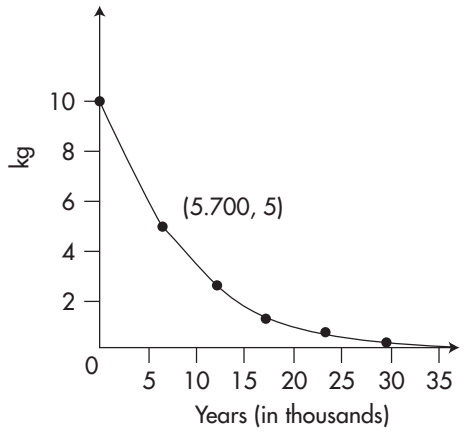
A. 164.4 meters

B. 152.8 meters

C. 144 meters

D. 139.8 meters

Carbon-14 has a half-life of 5,700 years. The graph below shows the decay of a 10 kilogram sample over several thousand years.



31. What is the best estimate of the weight of the carbon-14 sample after 19,000 years?

A. 1.4 kg

B. 0.9 kg

C. 0.2 kg

D. 0.08 kg

32. Approximately how many years have passed when the carbon-14 sample decays to 4.1 kg?

7,000 years is [less than / equal to / greater than] carbon decay to 4.1 kg

On the GED® test this would be a cloze or drop-down item. Here, please select your answer from the choices given.

A. less than

B. equal to

C. greater than

D. none of the above

33. The scale on a state map of Connecticut indicates that 1 inch = 6.5 miles. If the distance between Bristol and New Haven is 31 miles, what is the distance on the map? (Round your answer to the nearest tenth of an inch). Place a check in the brackets next to your answer. This would be a drag-and-drop question. For now, choose the answer that you believe is the correct answer.

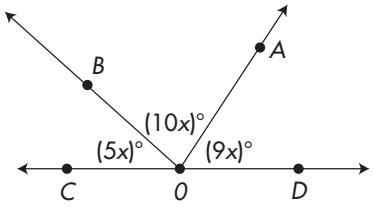
A. 3.9 [ ]

B. 4.2 [ ]

C. 4.7 [ ]

D. 4.8 [ ]

34. What is the measure of $\angle BOC$ in the diagram below? Place your answer in the boxes below (ignore the degrees symbol). This would be a fill-in-the-blank question type on the GED® test. Here, mark your answer choice.



A. 35.7

B. 37.5

C. 73.5

D. 33.2

35. What is the slant height of a cone with a surface area that measures 435.675 in² and a radius that measures 7.5 inches? ($\pi = 3.14$).

A. 10.6

B. 11

C. 11.2

D. 12.4

36. The width of a wavelength in the visible light region of the electromagnetic spectrum is 4.6×10^{-6} meters. Another wavelength in the microwave portion of the electromagnetic spectrum has a width of 3.22×10^{-2}. How many wavelengths of the visible light, if laid side to side, would fit within one length of the microwave wavelength? Express your answer in scientific notation.

A. 7×10^{4}

B. 7.2×10^{3}

C. 7×10^{3}

D. 6.85×10^{-3}

37. A vendor of ornamental rope charges \$0.15 per inch or \$1.55 per foot. What is the savings on an order of 7 yards of chain if it is purchased on a per foot basis rather than a per inch basis? Place your answer in the boxes below (ignore the \$ sign).

On the GED® test this would be a fill-in-the-blank question type. Here, please select your answer from the four provided.

A. \$5.25

B. \$3.75

C. \$3.65

D. \$2.45

38. A local fishing pier registered the following catches (in pounds) for a six day period.

Day	Weight
1	108
2	112
3	104
4	109
5	118
6	112

What is the difference between the median and the mean of these weights? Enter your answer in the boxes below.

On the GED® test this would be a fill-in-the-blank question type. Here, please select your answer from the four provided.

A. 10

B. 8

C. 5

D. 0

39. Find the missing y-coordinate if $(7, y)$ and $(4, -3)$ lie on a line that has slope $-\frac{2}{5}$.

A. 4.8

B. –2.6

C. –4.2

D. –7.8

40. Katie can spend up to \$100 on some inexpensive skirts. If each skirt costs \$8, which of the following expressions reflects the conditions of Katie's purchase?

A. $s + 8 = 100$

B. $s + 8 < 100$

C. $8s < 100$

D. $8s \leq 100$

41. Simplify the following expression:

$$\frac{x^3 + 6x^2 - 16x}{x^2 - 2x}$$

A. $\frac{x+8}{x-2}$

B. $\frac{x(x-8)}{x+2}$

C. $x + 8$

D. $x - 2$

42. $\sqrt{2x+2} - 3 = 15$

Find the value of x and place your answer in the box below.

On the GED® test this would be a fill-in-the-blank question type. Here, please select your answer from the four provided.

A. 146

B. 155

C. 161

D. 171

43. If \$19.50 represents a 22% discount off the price of a tennis racquet, what were the *cents* of the racquet's original price? (Round your answer to the nearest cent.) Place a check mark next to your answer.

___63 ____64 ____71 ____96

On the GED® test this would be a hot-spot question type. Here, please select your answer from the four provided.

A. 63

B. 64

C. 71

D. 96

44. A cruise line ship left Port A and traveled 90 miles due west and then 400 miles due north.

At this point, the ship docked at Port B. What is the shortest distance between Port A and Port B?

Place your answer in the box below.

On the GED® test this would be a fill-in-the-blank question type. Here, please select your answer from the four provided.

A. 385

B. 390

C. 410

D. 450

45. Which of the following is the graph of the following inequalities:

$-8x + 2 > -12$ or $4x - 6 \geq 16$

A. 

B. 

C. 

D. 

46. A rope measures 30 yards in length. How many circles of radius 5 feet can be created from this length of rope. Drag your answer to the boxes below.

Hundreds [0] [1]

Tens [0] [1] [3] [4]

Ones [1] [2] [3] [5]

Hundreds [ ] Tens [ ] Ones [ ]

On the GED ® test this would be a drag-and-drop question type. Here, please select your answer from the four provided.

A. Hundreds [0] Tens [0] ones [2]

B. Hundreds [1] Tens [1] ones [2]

C. Hundreds [0] Tens [2] ones [2]

D. Hundreds [1] Tens [0] ones [3]

The following information is to be used for questions 47 and 48.

A housing development outside of Little Rock had sold 240 of its homes 1.6 years after its grand opening. After 4 years and 3 months, the number of homes sold rose to 450.

47. If the number of sales continued to grow at the same rate, how many homes will have been sold at the 6-year mark? (Round your answer to the nearest home sold.) Place your answer in the box below.

On the GED ® test this would be a fill-in-the-blank question type. Here, please select your answer from the four provided.

A. 268

B. 387

C. 553

D. 589

48. How many years are needed to sell 1,150 houses (round your answer to the nearest year)?

A. 13

B. 10

C. 9

D. 6

49. $2\frac{1}{3}x - 3\frac{5}{8} = 7\frac{1}{4}$

$x = ?$

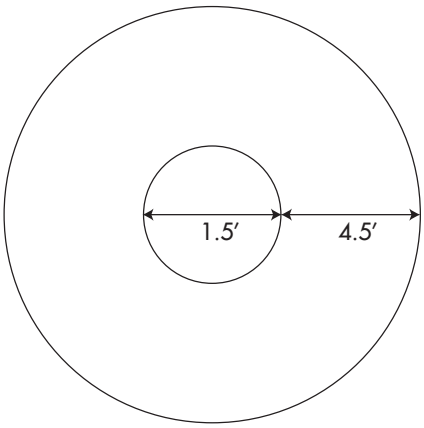
A. $3\frac{5}{8}$

B. $4\frac{37}{56}$

C. 6

D. $6\frac{11}{18}$

50. A carnival game consists of throwing a bean bag on to circular target area painted on the floor. (See diagram below.)



If the width of the inner circle is 1.5 feet and the width of the outer circle is 4.5 feet, given that the bean bag falls on the target, what is the probability that it will land on the inner circle? (π = 3.14) Place you answer in the box below.

On the GED® test this would be a fill-in-the-blank question type. Here, please select your answer from the four provided.

A. 0.01

B. 0.02

C. 0.03

D. 0.04

51. How many ways can the president, vice president, and secretary of the senior class be selected from a pool of 12 students? Place the appropriate symbol/number(s) in the brackets below.

[ ] [ ] [ ]

[15] [12] [3] [P] [C] [N] [R] [!]

On the GED® test this would be a drag-and-drop question type. Here, please select your answer from the four provided.

A. 12 C N

B. 3 C R

C. 15 P !

D. 12 P 3