

ST. KATHARINE DREXEL PREP MATH DEPARTMENT

SUMMER MATH PACKET 2017

THIS PACKET IS FOR STUDENTS ENTERING:

ADVANCED MATHEMATICS

11th GRADE ACCELERATED STUDENTS

12TH GRADE STUDENTS



DIRECTIONS: IN ORDER TO RECEIVE MAXIMUM CREDIT:

- **ALL PROBLEMS MUST BE COMPLETED.**
- **ALL WORK MUST BE SHOWN ON LOOSE LEAF PAPER AND MUST BE COMPLETED WITH A PENCIL ONLY. PAPERS WILL NOT BE GRADED IF THE WORK IS DONE WITH AN INK PEN.**
- **YOU MAY USE MATH WEBSITES SUCH AS KHAN ACADEMY FOR ASSISTANCE**

DUE DATE: THE SUMMER MATH PACKET MUST BE SUBMITTED THE FIRST WEEK OF SCHOOL FOR A HOMEWORK GRADE. YOUR MATH TEACHER WILL SELECT PROBLEMS FROM THE MATH PACKET TO CREATE YOUR FIRST QUIZ IN YOUR MATH COURSE.

MATH SUMMER PACKET – ADV.MATH/ACT PRACTICE PROBLEMS 2017
11TH ACCELERATED STUDENTS AND 12TH GRADE STUDENTS

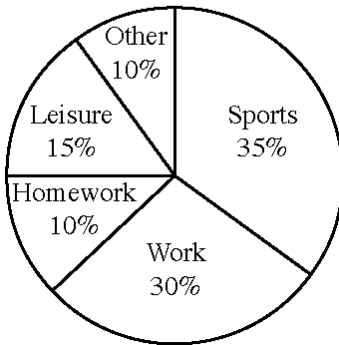
Name _____

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. 180 is 45% of what number?
a. 81 b. 145 c. 204 d. 400 e. 340
- _____ 2. Solve $3(8 - x) = -6x + 15$.
a. -3 b. -1 c. 2 d. -2 e. 3
- _____ 3. During the last 10 years, the population of a town increased from 6000 to 10,320. What percent increase does this represent?
a. 80% b. 72% c. 75% d. 78% e. 70%
- _____ 4. The first five batters on a softball team's lineup have the following numbers of hits for the season: 83, 71, 68, 62, 61. What is the mean number of hits for these five players?
a. 71 b. 69 c. 68 d. 70 e. 67
- _____ 5. A dance company is planning a program that will consist of one ballet, one tap, and one jazz routine. In its repertoire are five ballet, three jazz, and six tap routines. How many different programs are possible?
a. 56 b. 90 c. 14 d. 28 e. 72
- _____ 6. Which of these numbers is between 6 and 7?
a. $2\sqrt{5}$ b. $3\sqrt{6}$ c. $6\sqrt{2}$ d. $4\sqrt{3}$ e. $5\sqrt{2}$
- _____ 7. Erika read 90 pages in $2\frac{1}{2}$ hours. At the same time, how many hours would it take her to read 225 pages?
a. $5\frac{3}{4}$ b. $5\frac{1}{2}$ c. 6 d. $6\frac{1}{2}$ e. $6\frac{1}{4}$
- _____ 8. After $\frac{4\frac{4}{9}}{1\frac{1}{5}}$ has been simplified to a mixed number in lowest terms, what is the numerator of the fraction?
a. 19 b. 16 c. 18 d. 20 e. 22
- _____ 9. For a birthday party, Marissa bought three cartons of ice cream at \$4.59 each and two packages of plastic bowls at \$3.00 each. If food is not taxed and non-emergency grocery items are taxed at the rate of 5%, what was her total bill?
a. \$20.76 b. \$20.37 c. \$19.77 d. \$20.27 e. \$20.07
- _____ 10. $\sqrt{\frac{1}{9}} - \sqrt{\frac{1}{36}} = ?$
a. $-\sqrt{\frac{1}{27}}$ b. $\frac{1}{6}$ c. -3 d. $\sqrt{\frac{1}{12}}$ e. $\frac{1}{2}$
- _____ 11. The circle graph below shows the results of a survey of the 660 students in a school. How many students participate in sports?

**After-School Activities
for 660 Students**



- a. 237 b. 35 c. 231 d. 243 e. 249

___ 12. $\frac{3}{5} + \frac{1}{3} = ?$

- a. $\frac{4}{5}$ b. $\frac{8}{15}$ c. $\frac{1}{2}$ d. $\frac{4}{15}$ e. $\frac{14}{15}$

- ___ 13. Which of these expressions represents the greatest number?

- a. $|-11 + (-4)| - |-4|$ d. $|-6 - (-12)| - 4$
 b. $-|7 - 3| + |-9 - 11|$ e. $-|-8| + |-9| + |4 - 8|$
 c. $|-8 + (-2)| + |-7|$

___ 14. Solve for x if $\frac{12}{21} = \frac{x+4}{2x+4}$.

- a. 8 b. 10 c. 9 d. 12 e. $8\frac{1}{2}$

- ___ 15. A toy maker has $6\frac{1}{4}$ yards of fabric. He wants to make five stuffed animals that each require $\frac{7}{8}$ yard of fabric. How many yards of fabric will he have left?

- a. $1\frac{1}{2}$ yd b. $1\frac{3}{8}$ yd c. $1\frac{3}{4}$ yd d. $1\frac{5}{8}$ yd e. $1\frac{7}{8}$ yd

___ 16. $4^0 + 3^{-1} + 2^{-2} + 1^{-3} = ?$

- a. $2\frac{7}{12}$ b. $3\frac{7}{12}$ c. $3\frac{1}{12}$ d. $2\frac{1}{12}$ e. $\frac{7}{12}$

- ___ 17. Three quarters of Andre's collection of coins is pennies. Of the remaining coins, $\frac{2}{5}$ are quarters. If there are 280 coins in his collection, what is the value of the quarters?

- a. \$12.50 b. \$9.25 c. \$7.00 d. \$21.00 e. \$17.50

___ 18. $\frac{20}{10} + 30 \times 10 + \frac{40}{10^2} + 50 \times 10^2 = ?$

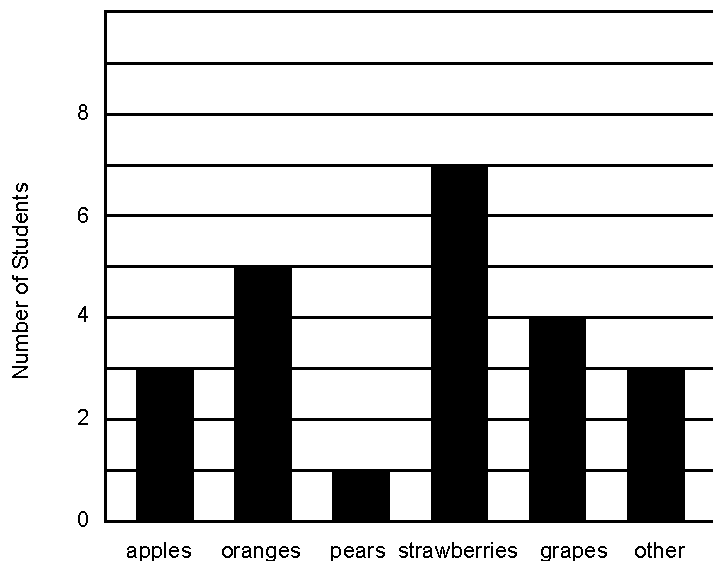
- a. 5302.4 b. 5320.4 c. 5432 d. 5032.4 e. 5032.04

- ___ 19. Students must choose one of five books for their next book report. The books have 218, 180, 240, 164, and 128 pages, respectively. What is the range in the number of pages per book?

- a. 144 b. 180 c. 162 d. 186 e. 112

- ___ 20. A class of kindergartners was interviewed about their favorite fruit, with the results shown in the bar graph below. How many students are in the class?

Favorite Fruits of Kindergartners



- a. 19 b. 23 c. 21 d. 25 e. 22

___ 21. Mercury, in its metallic form, has a melting point of -38.9°C and a boiling point of 356.6°C . How many degrees higher is the boiling point than the melting point?

- a. 384.7°C b. 385.5°C c. 395.5°C d. 316.3°C e. 317.7°C

___ 22. Solve $0.2(0.4 - x) = 0.6$.

- a. 0.1 b. 3.4 c. 2.4 d. -1.8 e. -2.6

___ 23. Selena has eight quarters, five dimes, and three nickels in her pocket. If one coin is selected at random, what is the probability that it will not be a quarter?

- a. $\frac{1}{4}$ b. $\frac{1}{5}$ c. $\frac{5}{11}$ d. $\frac{1}{2}$ e. $\frac{1}{3}$

___ 24. When Alex joined a discount CD club, he was allowed to buy 10 CDs at \$0.50 each. If he buys one CD per month for the next year at \$14.95 each plus \$3.70 shipping and handling, what will be the average price for all the CDs he purchased?

- a. \$10.55 b. \$10.45 c. \$10.50 d. \$10.35 e. \$10.40

___ 25. Monica works 40 hours per week at two different jobs. She works h hours per week at the first job and is paid r dollars per hour. At her second job she is paid s dollars per hour. Which expression gives her weekly pay from the two jobs?

- a. $rh + (40 - h)s$ d. $(40 + h)(r + s)$
 b. $rh + (40 + h)s$ e. $rs + (40 - h)$
 c. $h(r + s) - 40$

___ 26. Simplify $\sqrt{\frac{1}{24}} - \sqrt{\frac{1}{54}}$.

- a. $\frac{\sqrt{6}}{36}$ b. $\frac{\sqrt{6}}{18}$ c. $\frac{\sqrt{6}}{12}$ d. $-\frac{\sqrt{30}}{30}$ e. $-\frac{\sqrt{6}}{6}$

___ 27. Solve $\frac{2x-3}{13} = \frac{1}{x+4}$.

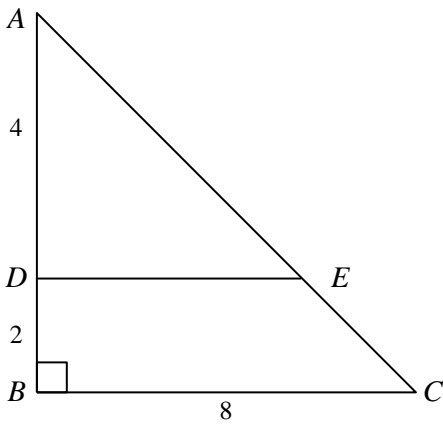
- a. $-\frac{9}{2}, -5$ b. $-\frac{7}{2}, 3$ c. $\frac{3}{2}, 4$ d. $\frac{1}{2}, -9$ e. $\frac{5}{2}, -5$

- ___ 28. Evaluate $a(a - \sqrt{b})^{-1}$ when $a = 4$ and $b = \frac{1}{4}$.
- a. $\frac{8}{7}$ b. $\frac{7}{4}$ c. $-\frac{7}{2}$ d. $\frac{4}{7}$ e. 14
- ___ 29. Three times 7 less than x equals 11 more than x . Which of these equations could you use to find x ?
- a. $x - 3 \cdot 7 = 11 + x$ d. $3(7 - x) = x + 11$
b. $3 \cdot 7 - 3 \cdot x = x - 11$ e. $3(x - 7) = x + 11$
c. $3 \cdot 7 - x = x + 11$
- ___ 30. $\frac{\sqrt{121} - \sqrt{49}}{\sqrt{4}} = ?$
- a. $3\sqrt{2}$ b. $6\sqrt{2}$ c. 3 d. 2 e. $2\sqrt{3}$
- ___ 31. Factor $9x^2 - 30x + 25$.
- a. $(3x - 5)(3x + 5)$ d. $(3x - 2)\left(3x - \frac{25}{2}\right)$
b. $(3x - 5)^2$ e. $(3x - 10)(3x + 15)$
c. $(3x + 5)^2$
- ___ 32. Evaluate $yx^y - xy^x$ for $x = \frac{1}{2}$ and $y = 4$.
- a. $\frac{3}{4}$ b. $-1\frac{3}{4}$ c. $\frac{1}{4}$ d. $-\frac{1}{2}$ e. $-\frac{3}{4}$
- ___ 33. Simplify $\frac{a^2 - b^2}{a - b} - 2b$.
- a. $a - b$ b. $a^2 - b$ c. $a + b$ d. $a - b^2$ e. $a^2 + b^2$
- ___ 34. For an interval training program, a runner alternately runs and walks. She walks at w minutes per mile and runs at r minutes per mile. She walks for twice as long as she runs. If she trains for m minutes, how many miles has she covered?
- a. $\frac{1}{3}mr + \frac{2}{3}m\omega$ d. $(m + 2m)(r + w)$
b. $\frac{m}{3r} + \frac{2m}{3w}$ e. $\left(\frac{m}{2}\right)r + m\omega$
c. $\frac{m}{2r} + \frac{2m}{w}$
- ___ 35. $\frac{\sqrt{0.0025}}{\sqrt{0.04}} = ?$
- a. 2.5 b. 0.25 c. 0.0025 d. 25 e. 0.025
- ___ 36. Factor $16x^2 - 121$.
- a. $(16x - 11)(x - 11)$ d. $(4x - 11)(4x + 11)$
b. $(2x + 11)(8x - 11)$ e. $(4x - 11)^2$
c. $(2x - 11)(8x + 11)$
- ___ 37. The surface area of a rectangular prism with height h and base of length ℓ and width w is given by the formula $h(2\ell + 2w) + 2\ell w$. If a rectangular prism with a base of length 6 feet and width 3 feet has a surface area of 225 square feet, find its height.
- a. 8.5 ft b. 10.5 ft c. 9.5 ft d. 9 ft e. 10 ft

- ___ 38. Six more than 3 times x equals 4 times 2 less than x . Find x .
 a. 9.5 b. -2.5 c. 6 d. 26 e. 14
- ___ 39. $\frac{(x^2y)^4 x^3y^{-2}}{x^{-1}y^2} = ?$
 a. x^6 b. $\frac{x^5}{y}$ c. $\frac{x^4}{y^4}$ d. x^3y e. x^4
- ___ 40. A rectangle with length $2x - 1$ and width $x + 5$ has an area of 156 square units. Find x .
 a. 9 b. 13 c. 7 or $\frac{23}{2}$ d. 7 e. 12
- ___ 41. An equilateral triangle with sides of length s has an area equal to $\frac{s\sqrt{3}}{4}$. Find the length of one side of an equilateral triangle if its area is $25\sqrt{3}$ square units.
 a. $5\sqrt{3}$ b. 5 c. $\frac{25\sqrt{3}}{4}$ d. $10\sqrt{3}$ e. 10
- ___ 42. $a^{\frac{1}{2}} a^{\frac{2}{3}} = ?$
 a. $a\sqrt{a}$ b. $\sqrt[3]{a}$ c. $a^6\sqrt{a}$ d. $a^3\sqrt{a}$ e. $\sqrt[3]{a}$
- ___ 43. Factor $6x^2 - 5x - 4$.
 a. $(6x - 1)(x + 4)$ d. $(2x + 1)(2x + 4)$
 b. $(3x - 2)(2x + 2)$ e. $(3x + 2)(2x - 2)$
 c. $(3x - 4)(2x + 1)$
- ___ 44. Evaluate $\frac{m^2 + m^{-2} + m}{m}$ for $m = 0.5$.
 a. $5\frac{1}{4}$ b. $25\frac{1}{2}$ c. $20\frac{1}{4}$ d. $15\frac{3}{4}$ e. $10\frac{1}{2}$
- ___ 45. For one week all of the cassette tapes at a music store are discounted by 20%. The sales tax rate is 6%. If Mario buys t tapes originally priced at \$12 each and c CDs priced at \$15 each, write an expression for his total bill.
 a. $1.06(9.6t + 15c)$ d. $1.06(10t + 5c)$
 b. $6(20t + 15c)$ e. $0.06(9.6 + 12c)$
 c. $1.06 \cdot 9.6t + 15c$
- ___ 46. Simplify $(4d)^{\frac{1}{2}}(8d)^{\frac{1}{3}}(16d)^{\frac{1}{4}}$.
 a. $\frac{1}{6d^{24}}$ b. $8d^{12}\sqrt{d}$ c. $8d^6\sqrt{d}$ d. $\frac{11}{2d^{12}}$ e. $\frac{13}{6d^{12}}$
- ___ 47. The product of a number and 3 more than twice the number is 275. Find the number.
 a. 13 or $-\frac{23}{2}$ d. 11 or $-\frac{25}{2}$
 b. 11 or $-\frac{23}{2}$ e. 13 or $-\frac{25}{2}$
 c. 11 or $-\frac{21}{2}$
- ___ 48. For any triangle with sides of lengths a , b , and c , the area is given by the formula $A = \sqrt{s(s-a)(s-b)(s-c)}$, where s is equal to one-half the length of the perimeter. What is the area of a triangle in square units with sides of lengths 2, 3, and 3?
 a. $4\sqrt{2}$ b. $2\sqrt{2}$ c. $6\sqrt{2}$ d. $20\sqrt{3}$ e. $4\sqrt{3}$

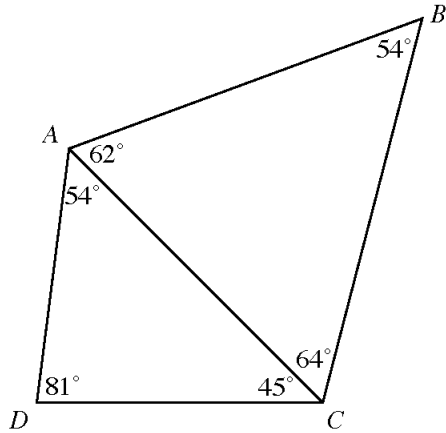
- _____ 49. Simplify $\frac{m}{2} + \frac{2m}{3} + \frac{3m}{4}$.
- a. $\frac{11m}{9}$ b. $\frac{23m}{12}$ c. $\frac{2m}{3}$ d. $\frac{11m}{12}$ e. $\frac{21m}{12}$
- _____ 50. Use the quadratic formula to solve $3x^2 - 2x - 4 = 0$ for x .
- a. $\frac{1}{3} \pm \frac{2\sqrt{13}}{3}$ d. $\frac{1}{3} \pm \frac{\sqrt{13}}{3}$
b. $\frac{1}{6} \pm \frac{2\sqrt{13}}{3}$ e. $\frac{5}{6} \pm \frac{2\sqrt{13}}{3}$
c. $\frac{1}{6} \pm \frac{\sqrt{13}}{6}$
- _____ 51. Which of the following quadratic equations has two real solutions?
- a. $x^2 + 5x + 8 = 0$ d. $2x^2 - 4x + 3 = 0$
b. $2x^2 - 5x + 3 = 0$ e. $3x^2 - 2x + 1 = 0$
c. $3x^2 - 3x + 2 = 0$
- _____ 52. Solve $\frac{2}{x} - \frac{9}{x+4} = 2$.
- a. $\frac{1}{4}, 8$ b. $\frac{1}{2}, 8$ c. $-\frac{1}{4}, -4$ d. $\frac{3}{4}, -8$ e. $-\frac{1}{2}, 4$
- _____ 53. Find the product $(x^2 + 4x - 3)(3x + 2)$.
- a. $3x^3 + 14x^2 + x - 6$ d. $3x^3 + 12x^2 - x - 6$
b. $3x^3 + 14x^2 - x - 6$ e. $3x^3 + 10x^2 - x - 6$
c. $3x^3 - 10x^2 + x - 6$
- _____ 54. What is the sixth term of the geometric sequence whose first term is 2 and whose fourth term is -54 ?
- a. -324 b. 1458 c. -648 d. 540 e. -486
- _____ 55. Find y if $2x + 4y = 2$ and $4x + y = 18$.
- a. 2 b. -2 c. -4 d. 4 e. 6
- _____ 56. A company ships two different products, one in smaller packages that weighs 12 pounds and the other in a 20-pound package. A shipment of nine packages weighs a total of 124 pounds. What is the total weight of the smaller packages?
- a. 72 lb b. 48 lb c. 37 lb d. 60 lb e. 84 lb
- _____ 57. $(1 - 2i)^3 = ?$
- a. $3 - 8i$ b. $-11 + 2i$ c. $-6 + 4i$ d. $13 - 14i$ e. $1 - 8i$
- _____ 58. Solve $2x^2 - 5x + 1 = 0$.
- a. $\frac{5}{4} \pm \frac{\sqrt{11}}{4}$ d. $-\frac{5}{4} \pm \frac{\sqrt{13}}{4}$
b. $-\frac{5}{4} \pm \frac{\sqrt{33}}{4}$ e. $\frac{7}{4} \pm \frac{\sqrt{17}}{4}$
c. $\frac{5}{4} \pm \frac{\sqrt{17}}{4}$
- _____ 59. $\frac{\sqrt[4]{x^2} \sqrt[4]{x^4}}{\sqrt[4]{x^8}} = ?$
- a. $\frac{-5}{x^4}$ b. $\frac{3}{x^4}$ c. $\frac{3}{x^4}$ d. $\frac{1}{x^2}$ e. $\frac{1}{x^4}$

- ___ 60. What is the remainder in the division $(x^3 - 2x^2 + 3x - 4) \div (x - 2)$?
- a. -2 b. 2 c. 0 d. 1 e. -10
- ___ 61. Solve $|3x + 2| \leq 5$.
- a. $x \geq 1$ or $x \leq -\frac{7}{3}$ d. $-\frac{7}{3} \leq x \leq 1$
b. $x \leq -1$ or $x \geq \frac{7}{3}$ e. $1 \leq x \leq \frac{7}{3}$
c. $-1 \leq x \leq \frac{7}{3}$
- ___ 62. What is the eighteenth term in the arithmetic sequence 87, 94, 101, ...?
- a. 192 b. 206 c. 220 d. 199 e. 213
- ___ 63. Sally has 42 coins, all dimes and nickels, that have a total value of \$3.00. How many nickels does she have?
- a. 22 b. 18 c. 20 d. 26 e. 24
- ___ 64. Find x if $y = x^2 - 4$ and $y = 2x + 3$.
- a. $4 \pm 2\sqrt{2}$ d. $2 \pm \sqrt{2}$
b. $1 \pm 2\sqrt{2}$ e. $-1 \pm \sqrt{2}$
c. $-2 \pm 2\sqrt{2}$
- ___ 65. If $A = \begin{bmatrix} 1 & 0 \\ -2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 4 \\ -3 & 2 \end{bmatrix}$, find $2A - 3B$.
- a. $\begin{bmatrix} 2 & 12 \\ -5 & 0 \end{bmatrix}$ b. $\begin{bmatrix} 2 & -12 \\ 5 & 0 \end{bmatrix}$ c. $\begin{bmatrix} 2 & -12 \\ -5 & 12 \end{bmatrix}$ d. $\begin{bmatrix} 2 & 12 \\ -5 & 0 \end{bmatrix}$ e. $\begin{bmatrix} 2 & -12 \\ -13 & 0 \end{bmatrix}$
- ___ 66. Which of the following is a root of $y = 2x^3 - x^2 - 12x - 9$?
- a. 1 b. $\frac{1}{2}$ c. -3 d. 3 e. 9
- ___ 67. $\frac{6+2i}{2-i} = ?$
- a. $2 - 3i$ b. $2 + 2i$ c. $3 + 2i$ d. $2 + 3i$ e. $3 - 2i$
- ___ 68. Four lines ℓ , m , n , and p are coplanar. If $\ell \perp m$, $m \perp n$, and $n \perp p$, which of the following statements is true?
- a. $n \parallel p$ b. $\ell \parallel p$ c. $\ell \perp n$ d. $m \perp p$ e. $\ell \parallel n$
- ___ 69. Suppose \overrightarrow{BC} bisects $\angle ABE$, and D is the interior of $\angle ABC$. If $m\angle CBD = 28^\circ$ and $m\angle ABE = 136^\circ$, find $m\angle ABD$.
- a. $n \parallel p$ b. $\ell \parallel p$ c. $\ell \perp n$ d. $m \perp p$ e. $\ell \parallel n$
- ___ 70. A base of an isosceles triangle has measure 75° . What is the measure of the vertex angle?
- a. 75° b. 105° c. 15° d. 30° e. 52.5°
- ___ 71. In right triangle ABC below, $\overline{DE} \parallel \overline{BC}$. If $AD = 4$, $BD = 2$, and $BC = 8$, find AE .



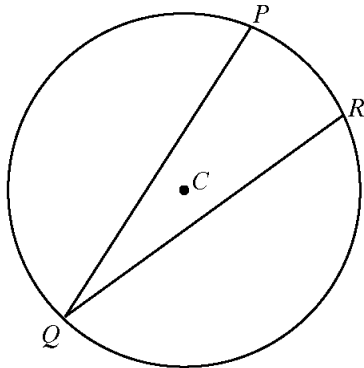
- a. 7 b. $6\frac{2}{3}$ c. $7\frac{1}{2}$ d. 6 e. 8

72. Which segment is the longest?



- a. \overline{CD} b. \overline{AD} c. \overline{AC} d. \overline{BC} e. \overline{AB}

73. Find the radius of circle C if $m\angle PQR = 24^\circ$ and the length of arc PR is 8π .



- a. 15 b. 20 c. 30 d. 60 e. 45

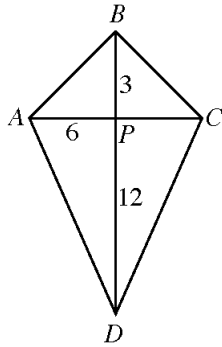
74. In circle R, chords \overline{AB} and \overline{CD} intersect at point M. If $CD = 21$, $AM = 4$, $BM = 27$, and \overline{CM} is shorter than \overline{DM} , find CM.

- a. 9 b. 13 c. 7 d. 8 e. 12

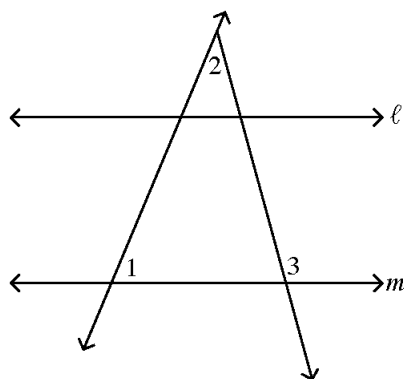
75. What is the surface area of a right cylinder of radius 3 meters and height 8 meters?

- a. $60\pi \text{ m}^2$ b. $72\pi \text{ m}^2$ c. $24\pi \text{ m}^2$ d. $63\pi \text{ m}^2$ e. $66\pi \text{ m}^2$

- ___ 76. If quadrilateral $ABCD$ is a square of area 98 square meters, find AC .
- a. $7\sqrt{2}$ m b. $14\sqrt{2}$ m c. 7 m d. $\frac{7\sqrt{2}}{2}$ m e. 14 m
- ___ 77. In parallelogram $LMNP$ diagonals \overline{LN} and \overline{MP} intersect at point Q . If $m\angle NLP = 25^\circ$ and $m\angle LPN = 85^\circ$, find $m\angle MLN$.
- a. 95° b. 60° c. 70° d. 85° e. 105°
- ___ 78. Find the perimeter of the kite shown below if $AP = 6$, $BP = 3$, and $DP = 12$.



- a. $18\sqrt{5}$ b. $15\sqrt{5}$ c. $12\sqrt{5}$ d. $6\sqrt{5}$ e. $9\sqrt{5}$
- ___ 79. A rhombus has diagonals of lengths 8 feet and 14 feet. Find its area.
- a. $30\sqrt{3}$ ft² b. 28 ft² c. 65 ft² d. 112 ft² e. 56 ft²
- ___ 80. An isosceles trapezoid has one base 23 inches long, and a height of 8 inches. If the area of the trapezoid is 136 square inches, what is its perimeter?
- a. 62 in. b. 54 in. c. 60 in. d. 56 in. e. 58 in.
- ___ 81. Suppose $\angle 1$ is supplementary to $\angle 2$, and $\angle 2$ is complimentary to $\angle 3$. Which of the following statements is true?
- a. $m\angle 1 + m\angle 3 = 180^\circ$ d. $m\angle 1 - m\angle 3 = 90^\circ$
 b. $m\angle 1 + m\angle 3 = 90^\circ$ e. none of the above
 c. $m\angle 1 - m\angle 1 = 90^\circ$
- ___ 82. Two angles of a triangle measure 78° and 24° . Classify the triangle by its sides and angles.
- a. equilateral equiangular d. isosceles acute
 b. isosceles right e. scalene obtuse
 c. scalene acute
- ___ 83. A hemisphere of radius 3 inches sits on top of a cylinder of radius 3 inches. The entire solid is 12 inches tall. What is the volume of the entire solid?
- a. 99π in² b. 126π in² c. 144π in² d. 117π in² e. 108π in²
- ___ 84. An equilateral triangle has sides of length 6. What is the length of a median of the triangle?
- a. $2\sqrt{2}$ b. $3\sqrt{3}$ c. $4\sqrt{3}$ d. $4\sqrt{2}$ e. 6
- ___ 85. A triangular prism has a base that is a right triangle with legs 5 and 12 feet long. The prism is 10 feet tall. What is its volume?
- a. 600 ft³ b. 300 ft³ c. 6 ft³ d. 450 ft³ e. 150 ft³
- ___ 86. Lines ℓ and m are parallel. If $m\angle 1 = 67^\circ$ and $m\angle 2 = 36^\circ$, find $m\angle 3$.



- a. 77° b. 103° c. 73° d. 89° e. 113°

87. Which point lies in the fourth quadrant?
 a. $(6, -2)$ b. $(5, 3)$ c. $(-3, -4)$ d. $(-8, 5)$ e. $(0, -7)$
88. Which of the following equations represents a line has slope 3 and passes the point at $(-4, -1)$?
 a. $x + 3y = -7$ d. $3x + y = 11$
 b. $3x - y = -11$ e. $x - 3y = -1$
 c. $3x + y = -13$
89. What is the distance between the points at $(-2, 5)$ and $(2, -1)$?
 a. $4\sqrt{3}$ b. $2\sqrt{13}$ c. $6\sqrt{2}$ d. $2\sqrt{15}$ e. 8
90. Which of the following equations represents a line that passes through point $(2, -1)$ and $(-4, 3)$?
 a. $3x + 2y = 4$ d. $2x + 3y = 1$
 b. $2x - 3y = 7$ e. $3x - 2y = -18$
 c. $3y - 2x = 1$
91. What is the slope of the line whose equation is $3x - 5y = 10$?
 a. $\frac{3}{5}$ b. $-\frac{3}{5}$ c. $\frac{5}{3}$ d. 2 e. $-\frac{5}{3}$
92. The compound inequality $y > 0$ or $x > 0$ represents which of the following regions?
 a. quadrants I, II, IV, positive x -axis, and positive y -axis
 b. quadrant I
 c. quadrants I, II, III, positive y -axis, and negative x -axis
 d. quadrants I, IV, and x -and y -axes
 e. quadrants II, III, and IV
93. The roots of the quadratic equation $y = x^4 - 2x^3 - 3x^2 + 8x - 4$ are 1, 2, and -2 . Which of the following is an equivalent statement?
 a. The given equation has relative maxima or minima at $x = 1, 2,$ and -2 .
 b. There are only three ordered pairs that satisfy the given equation.
 c. The maximum points of the give equation occur at $x = 1, 2,$ and -2 .
 d. The graph of the given equation crosses the y -axis at 1, 2, and -2 .
 e. The graph of the given equation crosses the x -axis at 1, 2, and -2 .
94. Point M is the midpoint of \overline{AB} , and point A is the midpoint of \overline{BC} . If A has coordinates $(-5, 4)$ and M has coordinates $(-3, 1)$, what are the coordinates of C ?
 a. $(-9, 10)$ b. $(3, -8)$ c. $(1, -5)$ d. $(-7, 7)$ e. $(-1, -2)$
95. What is an equation of the line perpendicular to the graph of $y = -2x + 5$ that passes through the point at $(4, 7)$?

- a. $x + 2y = 18$
- b. $x - 2y = -5$
- c. $2x + y = 15$

- d. $2x - y = 1$
- e. $x - 2y = -10$

___ 96. What is the slope of the line passing through the points at $(-5, -2)$ and $(3, 2)$?

- a. 2
- b. -2
- c. 4
- d. $-\frac{1}{2}$
- e. $\frac{1}{2}$

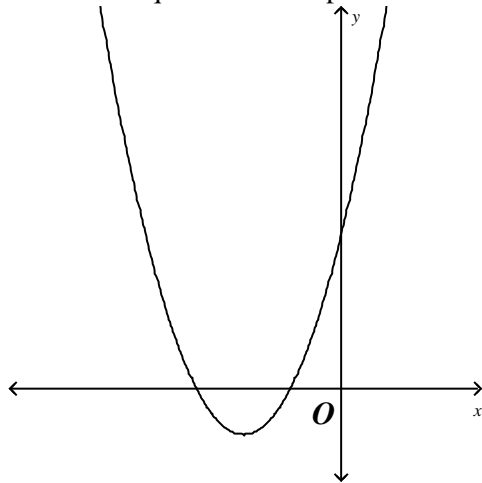
___ 97. What is an equation of the line with y -intercept 5 and x -intercept -3 ?

- a. $y = \frac{5}{3}x - 3$
- b. $y = \frac{3}{5}x + 3$
- c. $y = \frac{5}{3}x + 5$
- d. $y = \frac{3}{5}x + 5$
- e. $y = -\frac{5}{3}x + 5$

___ 98. What is the midpoint of \overline{AB} if A has coordinates $(3, -8)$ and B has coordinates $(-5, 2)$?

- a. $(-2, -3)$
- b. $(-2, -2)$
- c. $(-1, -3)$
- d. $(-2, -4)$
- e. $(-1, -4)$

___ 99. What is an equation for the parabola shown below?



- a. $y - 1 = x^2 - 2$
- b. $y = -\frac{1}{2}x + \frac{3}{2}$
- c. $y = -2x + 3$
- d. $y = 2x + 2$
- e. $y - 1 = (x - 2)^2$

___ 100. $\triangle ABC$ has vertices $A(4, 7)$, $B(9, 7)$, and $C(7, 3)$. What kind of triangle is $\triangle ABC$?

- a. isosceles
- b. right
- c. scalene
- d. equilateral
- e. obtuse