

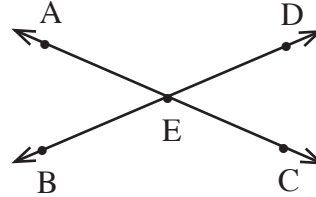
## 2005 Written Quest

1. Find the distance between the points  $(-1, 2)$  and  $(-3, -2)$ .

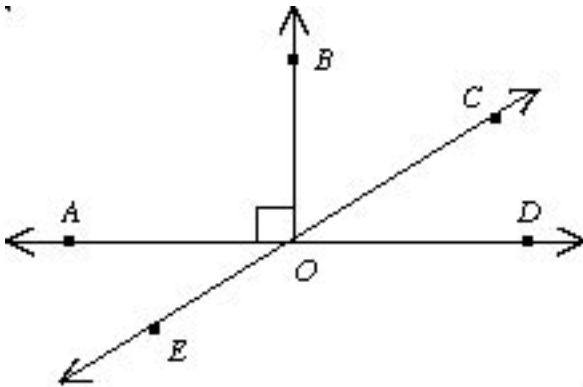
- a)  $2\sqrt{5}$       b) 20      c) 6      d) 4

2. In the figure shown,  $m\angle AED = 124^\circ$ . Which of the following statements is false?

- a)  $m\angle BEC = 56^\circ$   
 b)  $m\angle AEB = 56^\circ$   
 c)  $\angle BEC$  and  $\angle CED$  are adjacent angles  
 d)  $\angle AEB$  and  $\angle DEC$  are vertical angles



3. Name an angle supplementary to  $\angle AOC$ .



- a)  $\angle DOE$       b)  $\angle DOB$       c)  $\angle COD$  or  $\angle AOE$       d)  $\angle BOE$  or  $\angle BOD$

4. Decide which one of the following statements is false.

- a) Any three points lie on a distinct line.  
 b) A line contains at least two points.  
 c) Through any two distinct points there exists exactly one line.  
 d) Three noncollinear points determine a plane.

5.  $\angle 1$  and  $\angle 2$  are supplementary angles.  $\angle 1$  and  $\angle 3$  are vertical angles. If  $m\angle 2 = 72^\circ$  then find  $m\angle 3$ .

- a)  $28^\circ$       b)  $72^\circ$       c)  $18^\circ$       d)  $108^\circ$

6. Find the remainder for  $147,392,481 \div 917,643$ .

- a) 0.62      b) 569601      c) 146474838      d) 160

7. How many prime factors does 453600 have?

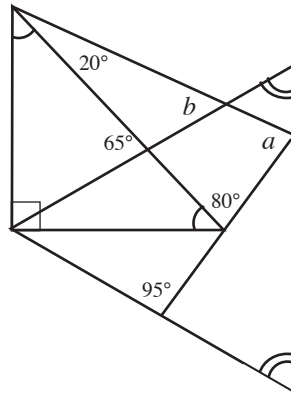
- a) 2      b) 3      c) 11      d) 4

8. Let  $a$  and  $b$  represent digits for the number  $31a,59b,076$  to be divisible by 4,  $a + b$  could be

- a) a multiple of 4.      b) a multiple of 12.  
 c) a multiple of 3      d) any values are acceptable for  $a$  and  $b$

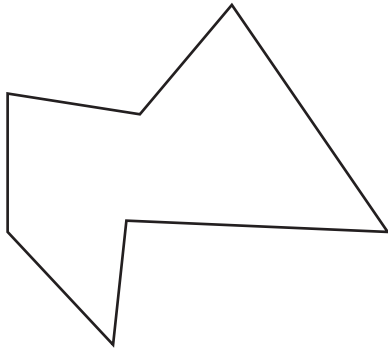
9. How many prime numbers are there between 150 and 160?
- a) 1                      b) 2                      c) 3                      d) 4
10. Which of the following numbers can be expressed as a sum of 2 or more consecutive odd whole numbers?
- i) 225                      ii) 400
- a) (i) only                      b) (ii) only  
c) Both (i) and (ii)                      d) none of these
11. What is the least number of numbers needed to get all sums from 1 to 100? For example, with just the numbers 1, 2, and 4, I can get the sums: 1, 2, 3, 4, 5, 6, and 7.
- a) 5                      b) 7                      c) 25                      d) 50
12. Which of the following statements is true?
- i) 240 is the greatest common divisor of 24 and 80.  
ii) 8 is the least common multiple of 24 and 80.
- a) (i) only                      b) (ii) only                      c) both (i) and (ii)                      d) none of these
13. What is the sum of the measures of the interior angles of an octagon?
- a)  $720^\circ$                       b)  $1080^\circ$                       c)  $135^\circ$                       d)  $1440^\circ$
14. What is the degree measure of one central angle in a regular pentagon?
- a)  $108^\circ$                       b)  $60^\circ$                       c)  $72^\circ$                       d)  $360^\circ$
15. A line perpendicular to  $y = \frac{2}{3}x - 7$  is:
- a)  $y = -\frac{7}{2}x - 6$                       b)  $y = -\frac{3}{2}x - 4$   
c)  $y = \frac{2}{3}x - 9$                       d)  $y = 2x - \frac{7}{3}$
16. In a store, a \$100 item was marked down by 20% for a sale. After the sale, the item's sale price was marked up 20%. What was the final price?
- a) \$96                      b) \$100                      c) \$64                      d) \$120
17. The ones digit of  $7^{2005}$  is:
- a) 3                      b) 7                      c) 9                      d) 1
18. Suppose  $a$  is an integer and  $a \neq 0$ . Then
- a)  $-a$  is negative                      b)  $-a^2$  is negative  
c)  $a^2$  is negative                      d) none of these

19. Find the measure of angle a.



- a)  $90^\circ$       b)  $65^\circ$       c)  $45^\circ$       d)  $80^\circ$

20. The sum of all of the interior angles of the figure below is:

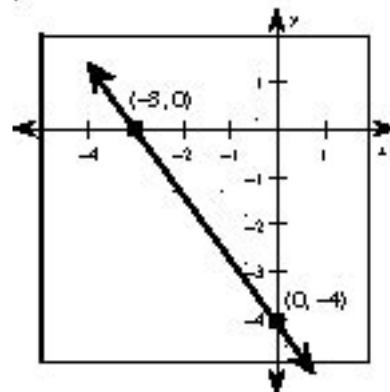


- a)  $900^\circ$       b)  $360^\circ$       c)  $1260^\circ$       d)  $800^\circ$

21. The cost of a school banquet is \$85 plus \$15 for each person attending. Determine the linear equation that models this problem. What is the cost for 70 people?

- a)  $y = 15x + 85$ ; \$1135      b)  $y = 15x - 85$ ; \$965  
 c)  $y = 85x + 15$ ; \$5965      d)  $y = 85x - 15$ ; \$5935

22. Write an equation of the line shown on the graph.



- a)  $4x + 3y - 12 = 0$       b)  $y = 3x - 4$   
 c)  $4x + 3y + 12 = 0$       d)  $y = -3x - 4$

23. What is the slope of the line that passes through the points (4, -5) and (-2, 11)?

- a) 3      b)  $-\frac{8}{3}$       c)  $-\frac{3}{8}$       d)  $\frac{3}{8}$

24. What is the mean of the following list of numbers? {1, 5, 3, 4, 5, 7, 8, 2, 4}

- a) 3      b)  $3\frac{3}{5}$       c) 4      d)  $4\frac{1}{3}$

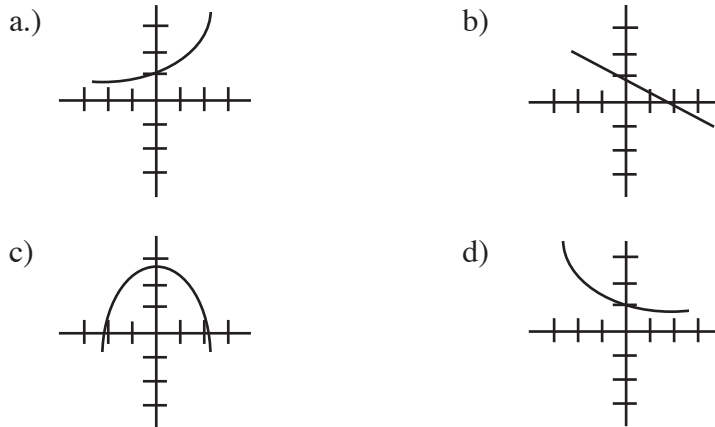
25. Which number is missing from the following list of numbers if the mean is 3 and the median is 12? {4, 5, 19, 20, 30}

- a) 3                      b) -40                      c) -60                      d) This is impossible.

26. When the fractional form of  $0.\overline{74}$  is written in simplest form, the sum of the numerator and denominator is:

- a) 157                      b) 87                      c) 173                      d) 174

27. Which of the following graphs best represents the radioactive decay of carbon 14?



28. Which of the following statements correctly describes this equation?

$$0.121221222\dots + 0.212112111\dots = 0.\overline{3}$$

- a) The sum of two irrational numbers may be rational.  
 b) The sum of two irrational numbers is always rational.  
 c) The sum of two irrational numbers may be irrational.  
 d) None of a, b, or c.

29. Which of the following events has a probability of  $\frac{6}{270,725}$  when drawing 4 cards, without replacement, from a deck of 52 cards?

- a) A, K, Q, J      b) A, A, K, K      c) A, 2, 2, 2      d) A, 2, 2, 2

30. A jar contains 13 marbles, 3 red, 4 white, and 6 blue. Two marbles are drawn without replacement. What is the probability that they are the same color?

- a)  $\frac{4}{13}$                       b)  $\frac{9}{13}$                       c)  $\frac{10}{13}$                       d) None of a, b, or c.

31. If a cat has 8 kittens, what is the probability that at least 5 of them are female? (Assume that there is an equal probability of getting a male or a female).

- a)  $\frac{5}{8}$                       b)  $\frac{93}{256}$                       c)  $\frac{56}{256}$                       d) None of a, b, or c.

32. Compare the perimeters of these polygons.

- i) A square with side 4 cm.
- ii) A rectangle with one side 3 cm and another 6 cm.
- iii) A triangle with one side 4 cm, one side 4 cm, and the length of the third side not given.

(Hint: Draw a few pictures)

- a) (i) < (ii) < (iii)
- b) (i) < (iii) < (ii)
- c) (iii) < (i) < (ii)
- d) None of a, b, or c.

33. How far will a wheel with radius  $5/\pi$  roll in two revolutions?

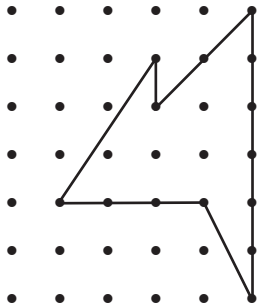
- a)  $25/\pi$  units
- b) 10 units
- c) 20 units
- d) none of these

34. Which of the following have equal areas?

- i) A square with 8 in sides.
- ii) A parallelogram with length 16 in and height 4 in.
- iii) A rectangle with dimensions 9 in x 7 in.

- a) (i) and (ii) only
- b) (i) and (iii) only
- c) (ii) and (iii) only
- d) none of a, b, or c.

35. Find the area of the figure given on a square lattice.



- a) 16 units<sup>2</sup>
- b) 9 units<sup>2</sup>
- c) 15 units<sup>2</sup>
- d) 10 units<sup>2</sup>

## Answers to 2005 Written Quest

1. a
2. a
3. c
4. a
5. d
6. b
7. d
8. d
9. b
10. c
11. b
12. d
13. b
14. c
15. b
16. a
17. b
18. b
19. d
20. a
21. a
22. c
23. b
24. d
25. c
26. a
27. d
28. a
29. b
30. a
31. b
32. c
33. c
34. a
35. d