

MTEL Preparation, Questions

WSC Mathematics Dept.

Nov. 2008

- Five boys have a box of 300 baseball cards. Javier is supposed to get 30% of the cards, John gets 60 cards, and Antoine gets $\frac{1}{5}$ of the cards. Bobby gets $\frac{2}{3}$ of what's left, and Taylor gets everything else.
How many cards does Taylor get?
(A.) 15
(B.) 30
(C.) 40
(D.) 60
- Mr. Stinson is teaching students to measure things using the size of the hands. His hand is 8 inches long when he spreads it out. He measures himself with a piece of paper, and uses his hands to measure his height. He is eight and a half hands tall, when he uses his own hands. One of his students, Tiffany, uses her hands on the piece of paper to measure his height, and she finds that he is $11\frac{1}{3}$ hands tall using her hands.
How long are Tiffany's hands?
(A.) $4\frac{1}{2}$ "
(B.) 5"
(C.) 6"
(D.) 9"
- Billy's Used Car Sales uses confusing discounts in order to make people think they are getting a better deal than they really are. You are looking at two cars: one is a 2004 Toyota Camry, and the other is a 2004 Saturn L200. The price on the Camry is \$6000, but they are taking \$400 off the price of Toyotas today. The price on the Saturn is \$5500, but they are taking 15% off Saturns today. You spin Billy's Wheel of Discounts for a second discount, and you get: 15% off the sale price of Toyotas, and 10% off the original price of Saturns.
What are the prices of the cars?
(A.) Saturn L200: \$4125; Toyota Camry: \$4760
(B.) Saturn L200: \$4125; Toyota Camry: \$4700
(C.) Toyota Camry: \$4760; Saturn L200: \$4208.50
(D.) Saturn L200: \$4208.50; Toyota Camry: \$4700
- Aidan is working on a sewing project where he needs a piece of fabric that is 60 inches by 42 inches.
Which of the following pieces of fabric will have the smallest amount left over after he cuts out the piece he needs?
(A.) 48" wide by 2 yards
(B.) 60" wide by $1\frac{1}{2}$ yards
(C.) 42" wide by 2 yards
(D.) 72" wide by $1\frac{2}{3}$ yards

5. Rachel is in the hardware store looking at wrenches. She wants to buy a wrench for a $\frac{3}{4}$ " nut, but they only have metric wrenches. She knows that there are 25.4 mm in 1".

Which wrench should she buy?

- (A.) 15mm
 (B.) 17mm
 (C.) 19mm
 (D.) 21mm
6. Melinda is building a model of her house. One afternoon, she goes out and measures the shadow of her house, and she sees that the shadow is 12 feet long. She knows that she is 4'8" tall, and her shadow is 14" long.

How tall is her house?

- (A.) 40'
 (B.) 48'
 (C.) 56'
 (D.) 32'
7. Lenny is laying down tiles in his kitchen floor. The afternoon he started the project, he got 36 tiles set. After setting these 36 tiles, he has covered 40% of the floor.

How many tiles are needed for the uncovered part of the floor?

- (A.) 60
 (B.) 90
 (C.) 48
 (D.) 54
8. The expression $48 \div 12 + (2 \times 3)^2$ can be simplified to which of the following?

- (A.) 40
 (B.) 1
 (C.) 22
 (D.) 48

9. The expression $(4 + 2) \div 3 \times 12$ can be simplified to which of the following?

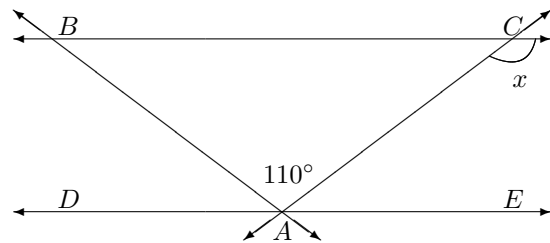
- (A.) 42
 (B.) 24
 (C.) $\frac{1}{6}$
 (D.) 3

10. Ms. Janssen is teaching her students about multiplication. She shows that the problem 3×5 can be represented as 5 stacks of 3 coins. Then she shows the class that it can also be represented as 3 stacks of 5 coins.

What property of multiplication is she illustrating?

- (A.) distributive
 (B.) associative
 (C.) identity
 (D.) commutative

Use the following diagram to answer the two questions below:



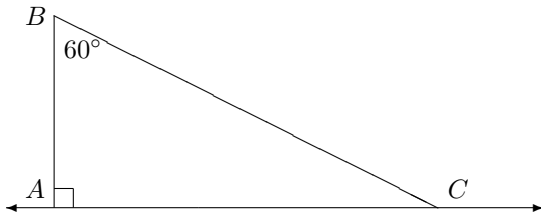
11. If line \overleftrightarrow{DE} is parallel to line \overleftrightarrow{BC} , then $\triangle ABC$ can be which of the following types of triangle?

- (A.) right
 (B.) isosceles
 (C.) equilateral
 (D.) acute

12. If $\angle ABC = \angle ACB$, what is the measure of the angle marked x , in degrees?

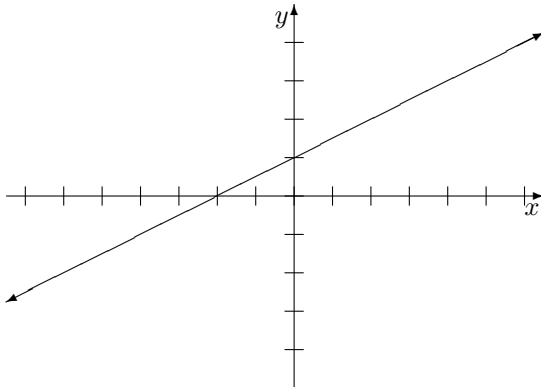
- (A.) 135°
 (B.) 145°
 (C.) 110°
 (D.) $\frac{5\pi}{6}$

13. Use the following diagram to answer the question below:



If we think of $\triangle ABC$ as the congruent half of a triangle $\triangle DBC$ that has line \overleftrightarrow{AC} as its axis of symmetry, and the point D is located such that \overleftrightarrow{DAB} forms a straight line, then what kind of triangle is $\triangle DBC$?

- (A.) right
 (B.) equilateral
 (C.) obtuse
 (D.) scalene
14. Consider the following graph:



Which of the following equations could be the equation of this line?

- (A.) $y = \frac{1}{2}x - 1$
 (B.) $y = 2x + 1$
 (C.) $y = x + 1$
 (D.) $y = \frac{1}{2}x + 2$

15. A *perfect number* is a whole number bigger than one that is equal to the sum of all of its proper divisors (a proper divisor is a divisor smaller than itself). So, for example, 6 is perfect, because its proper divisors are 1, 2 and 3; $1 + 2 + 3 = 6$.

Which of the following properties can you be sure that every perfect number satisfies?

- (A.) irrational
 (B.) prime
 (C.) composite
 (D.) imaginary
16. Dr. Shuttleworth is an astronomer measuring the size of craters on the moon. He reports that the diameter of the crater Alpha Seven is 4.25×10^4 meters.
- How many kilometers is the diameter of the crater Alpha Seven?
- (A.) 4.25 km
 (B.) 42.5 km
 (C.) 425 km
 (D.) 4250 km

17. Use the table below to answer the following question:

x	y
-1	-4
1	2
3	8

If this relation represents a linear function, which of the following points would be on this line?

- (A.) (0, 1)
 (B.) (0, -1)
 (C.) (-1, 0)
 (D.) (0, 3)

18. The equation of a line is given as $3x - 5y = 2$. The *slope-intercept form* for a line means that the equation is written in the form $y = mx + b$.

If the equation of the line that is given is solved for y to get the slope-intercept form of the line, this yields which of the following?

- (A.) $y = -\frac{3}{5}x + \frac{2}{5}$
 (B.) $y = \frac{3}{5}x - \frac{2}{5}$
 (C.) $y = \frac{5}{3}x - \frac{5}{2}$
 (D.) $y = \frac{3}{5}x + \frac{2}{5}$

19. A business has D dollars to spend opening a new office across town. They spend $\frac{1}{3}$ of the money getting office space, and \$400 buying an advertisement in the newspaper. They expect to spend half of what is left on office equipment.

How much money will they spend on office equipment?

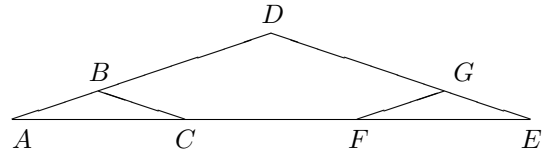
- (A.) $\frac{1}{3}D - 400$
 (B.) $\frac{2}{3}D - 400$
 (C.) $\frac{1}{2}D$
 (D.) $\frac{1}{3}D - 200$

20. Maria builds a box that is 4 feet wide by 2 feet deep by 2 feet high. She is in the paint store to buy enough paint to cover the entire box. A pint can of paint says that it covers 25 square feet; a quart can covers 50 square feet.

If she wants to have as little left over as possible, how much paint should she buy?

- (A.) 1 pint
 (B.) 1 quart
 (C.) 1 pint and 1 quart
 (D.) 2 quarts

21. Use the picture below to answer the question that follows.



A building contractor needs to build a truss to support the roof of a house. The diagram above indicates the shape of the truss.

We know that $\triangle ABC$ is congruent to $\triangle FGE$, $\triangle ABC$ is similar to $\triangle ADE$, and line segment \overline{AC} is $\frac{1}{3}$ the length of line segment \overline{AE} .

If the length of the board used for segments \overline{AD} and \overline{DE} are 12 feet, how long should the contractor cut the board for segment \overline{BC} ?

- (A.) 3 feet
 (B.) 4 feet
 (C.) 6 feet
 (D.) 12 feet

22. Erin has a bag that has five orange golf balls in it, three yellow golf balls, and six white golf balls in it. She closes her eyes, puts her hand in the bag, pulls out one orange golf ball, drops it back in the bag, then closes her eyes again, and pulls out a second golf ball at random.

What is the probability that the second golf ball is yellow?

- (A.) $\frac{3}{14}$
 (B.) $\frac{3}{13}$
 (C.) $\frac{1}{3}$
 (D.) $\frac{1}{14}$

Use the table below to answer the two questions that follow.

Dr. Jaiclin's Statistics class took an exam. The fifteen students in his class got the following scores:

100	97	94	92	88
86	86	82	77	73
70	68	68	68	43

23. What was the median score for his class?
- (A.) 68
 - (B.) 82
 - (C.) 84
 - (D.) 79.47
24. What was the mode of these scores?
- (A.) 100
 - (B.) 86
 - (C.) 82
 - (D.) 68
25. Jason takes a standardized test; his score report says that he scored in the 64th percentile. His guidance counselor wants to know what percent of students scored better than Jason did on the exam.
- What is the best estimate the guidance counselor can make?
- (A.) 32%
 - (B.) 36%
 - (C.) 64%
 - (D.) 72%