

Arizona's Instrument to Measure Standards (AIMS HS)

Mathematics

Released Items

November 15, 2007

Mathematics

DIRECTIONS: Read each question and choose the best answer.

1. If a figure is rotated, which of the following characteristics of the figure is preserved?

- I. angle measures
- II. perimeter
- III. area

- A I and II
- B II and III
- C I and III
- D I, II, and III

2. What is the value of the expression below?

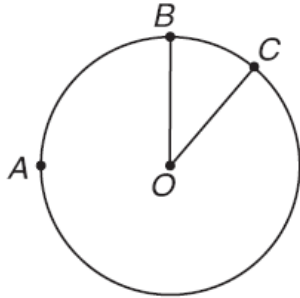
$$|-2| - |4| + |3 - 10|$$

- A -9
- B -1
- C 5
- D 13

3. Which of the following is an infinite set?

- A integers between -5 and 10
- B whole numbers between -5 and 10
- C natural numbers between -5 and 10
- D rational numbers between -5 and 10

4. Points A , B , and C lie on circle O , as shown below.



What is the measure of $\angle BOC$ if the measure of arc BAC is 320° ?

- A 40°
 - B 80°
 - C 160°
 - D 320°
5. Which is the solution to the inequality $2x - 3 \geq -4x + 2$?

- A $x \geq \frac{1}{2}$
- B $x \leq \frac{1}{2}$
- C $x \geq \frac{5}{6}$
- D $x \leq \frac{5}{6}$

6. In order to plan her budget, Jazmin created a chart of her expenses for three months. After paying her bills and setting aside her savings, she spends what is left for entertainment and miscellaneous expenses.

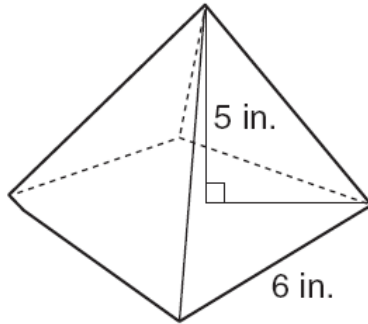
MONTHLY BUDGET

Wages	Month	Car Payment	Gasoline	Car Insurance	Savings	Entertainment and Miscellaneous
\$489	May	213	56	67	75	78
\$511	June	213	64	67	75	92
\$504	July	213	49	67	75	100

Which of the following is true?

- A Jazmin's wages vary monthly.
 - B Jazmin has \$100 each month to spend for entertainment.
 - C Jazmin's gas expenses have been consistently decreasing.
 - D Jazmin's car payment is over 50% of her wages.
7. Lee wants to make a sandwich. He has 5 types of meat, 3 types of cheese, and 2 types of sandwich spreads. If Lee chooses 1 meat, 1 cheese, and 1 sandwich spread, how many different combinations are possible for his sandwich?
- A 10
 - B 13
 - C 30
 - D 33

- 8.** The right square pyramid represented below has a base edge of 6 inches and a height of 5 inches.



What is the volume in cubic inches of the pyramid?

- A** 60
 - B** 90
 - C** 120
 - D** 180
- 9.** Sean is selecting an outfit from among 2 pairs of pants, 4 shirts, and 3 pairs of shoes. How many different outfits consisting of 1 pair of pants, 1 shirt, and 1 pair of shoes are possible?
- A** 9
 - B** 12
 - C** 24
 - D** 36

10. Which set contains an irrational number?

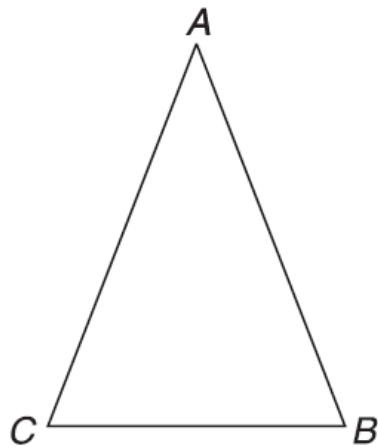
A $\left\{2300, 0.48, \frac{13}{1}\right\}$

B $\left\{18, 0.1, \frac{12}{5}\right\}$

C $\left\{\frac{3}{8}, 4, \sqrt{52}\right\}$

D $\left\{0.333\dots, \sqrt{4}, 10\right\}$

11. Figure ABC is an isosceles triangle with base \overline{BC} .



Which is a true statement about $\triangle ABC$?

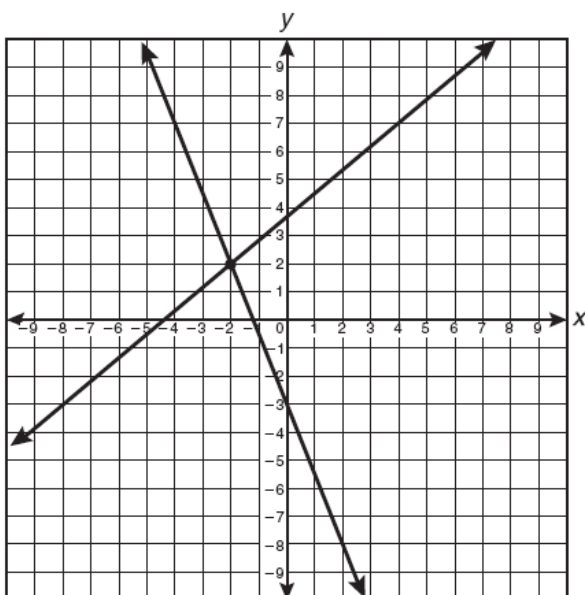
A $\angle A \cong \angle B$

B $\overline{AC} \cong \overline{AB}$

C $\overline{AC} \cong \overline{CB}$

D $\angle C \cong \angle A$

12. What is the apparent solution to the system of equations graphed below?



- A $(-2, -2)$
 - B $(-2, 2)$
 - C $(2, -2)$
 - D no solution
13. Joe has \$20.00. A six-pack of soda costs \$1.89, including tax. What is the greatest number of six-packs of soda he can buy?
- A 5
 - B 10
 - C 15
 - D 20

- 14.** Determine the slope m , x -intercept, and y -intercept of the equation $5x - 2y = 10$.

A slope $m = \frac{5}{2}$
 x -intercept = $(2, 0)$
 y -intercept = $(0, -5)$

B slope $m = -\frac{5}{2}$
 x -intercept = $(2, 0)$
 y -intercept = $(0, -5)$

C slope $m = \frac{2}{5}$
 x -intercept = $(-5, 0)$
 y -intercept = $(0, 2)$

D slope $m = -\frac{2}{5}$
 x -intercept = $(-5, 0)$
 y -intercept = $(0, 2)$

- 15.** What is the y -intercept of the graph of the equation $3x + 6y = 18$?

A -6

B -3

C 3

D 6

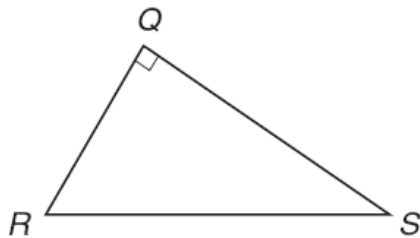
16. A pattern is described below.

- The first term is 2.
- The second term is 7.
- Each term after the second is found by adding 5 to the immediately preceding term.

What is the fifth term in this pattern?

- A** 5
- B** 12
- C** 17
- D** 22

17. Which of the following must be true for $\triangle QRS$?



- A** $QR + RS = QS$
- B** $QR + QS < RS$
- C** $QS + RS > QR$
- D** $QR - RS = QS$

18. The math club sold candy bars as a fundraiser. The number of candy bars sold by each member is shown below.

65 76 100 67 44 94 71
69 88 80 63 75 82 62

Which frequency chart accurately represents the data?

# of Candy Bars Sold	Frequency
40–49	1
50–59	1
60–69	3
70–79	3
80–89	5
90–99	0
100–109	1

A

# of Candy Bars Sold	Frequency
40–49	0
50–59	1
60–69	5
70–79	4
80–89	3
90–99	1
100–109	1

C

# of Candy Bars Sold	Frequency
40–49	2
50–59	0
60–69	5
70–79	3
80–89	2
90–99	1
100–109	1

B

# of Candy Bars Sold	Frequency
40–49	1
50–59	0
60–69	5
70–79	3
80–89	3
90–99	1
100–109	1

D

19. If $x = 4$ and $y = -1$, what is the value of the expression below?

$$\sqrt{2x - 8y}$$

- A** 0
- B** $\sqrt{5}$
- C** $\sqrt{14}$
- D** 4

- 20.** Which of the following is an example of independent events?
- A** flipping a fair coin and rolling a six-sided number cube
 - B** selecting the order in which one picture will be taken of each of four friends by drawing their names out of a hat
 - C** selecting the order in which each member of a history class will present a speech to the rest of the class
 - D** selecting two different-flavored pieces of candy, one piece at a time, from a bag containing four different flavors of candy

- 21.** Which of the following equations represents the line that passes through the points $(2, -6)$ and $(-4, 3)$?

A $y = -\frac{3}{2}x - 7$

B $y = -\frac{2}{3}x - 3$

C $y = -\frac{3}{2}x - 3$

D $y = -\frac{2}{3}x + \frac{1}{3}$

- 22.** The class wants to order pizza for a study session. There are 3 different vegetable toppings, 3 different meat toppings, and 2 types of crust available. How many different pizzas are possible with 1 vegetable topping, 1 meat topping, and 1 type of crust?

A 6

B 8

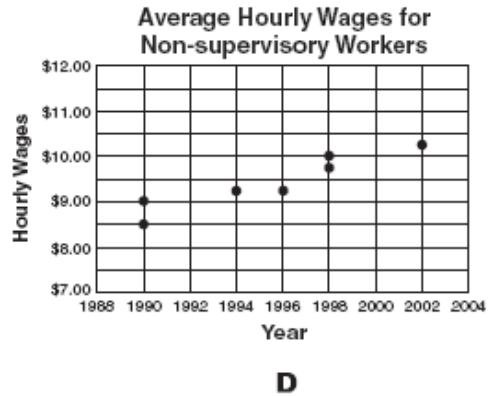
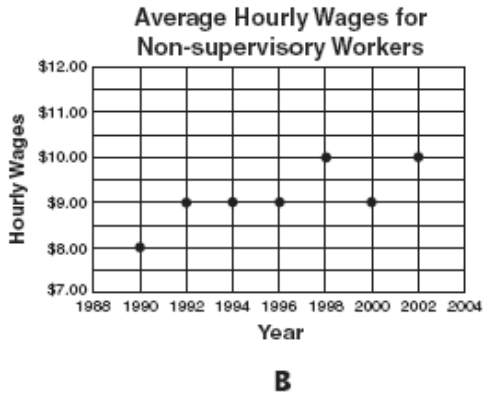
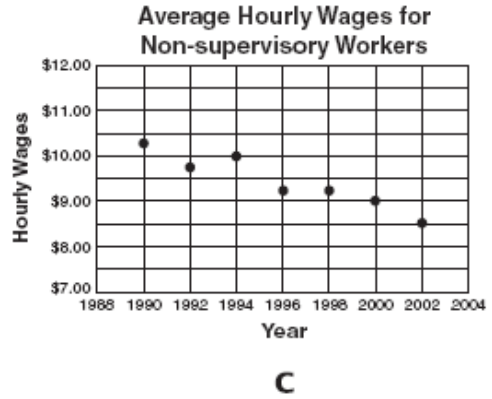
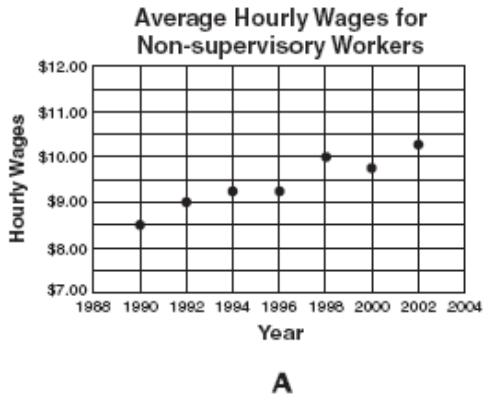
C 12

D 18

23. The table below shows the average hourly wages for non-supervisory workers for the years 1990–2002. Which scatter plot most accurately shows this information?

Average Hourly Wages for Non-supervisory Workers

Year	1990	1992	1994	1996	1998	2000	2002
Average Hourly Wage	\$8.50	\$9.00	\$9.25	\$9.25	\$10.00	\$9.75	\$10.25



24. For what value of x is the proportion below true?

$$\frac{x}{x-2} = \frac{3}{4}$$

- A** -6
- B** -2
- C** 2
- D** 8

- 25.** Maria took a taxicab from her home to the theater downtown. The taxicab company charges a flat fee of \$5.00 plus \$0.25 per mile. Which equation represents C , the total cost of her ride, in terms of m , the length of the trip in miles?

- A** $C = 0.25m$
- B** $C = 5.25m$
- C** $C = 5 + 0.25m$
- D** $C = 5m + 0.25$

- 26.** What is the solution to the equation below?

$$3(x - 4) = 5x - 6$$

- A** $x = -3$
- B** $x = \frac{3}{4}$
- C** $x = 1$
- D** $x = 9$

- 27.** The sequence below is defined by starting with 1, then adding 2 to the immediately preceding term. What is the 10th term of the sequence if the pattern continues?

1, 3, 5, 7, 9, . . .

- A** 9
 - B** 11
 - C** 19
 - D** 21
- 28.** What is the solution to the equation below?

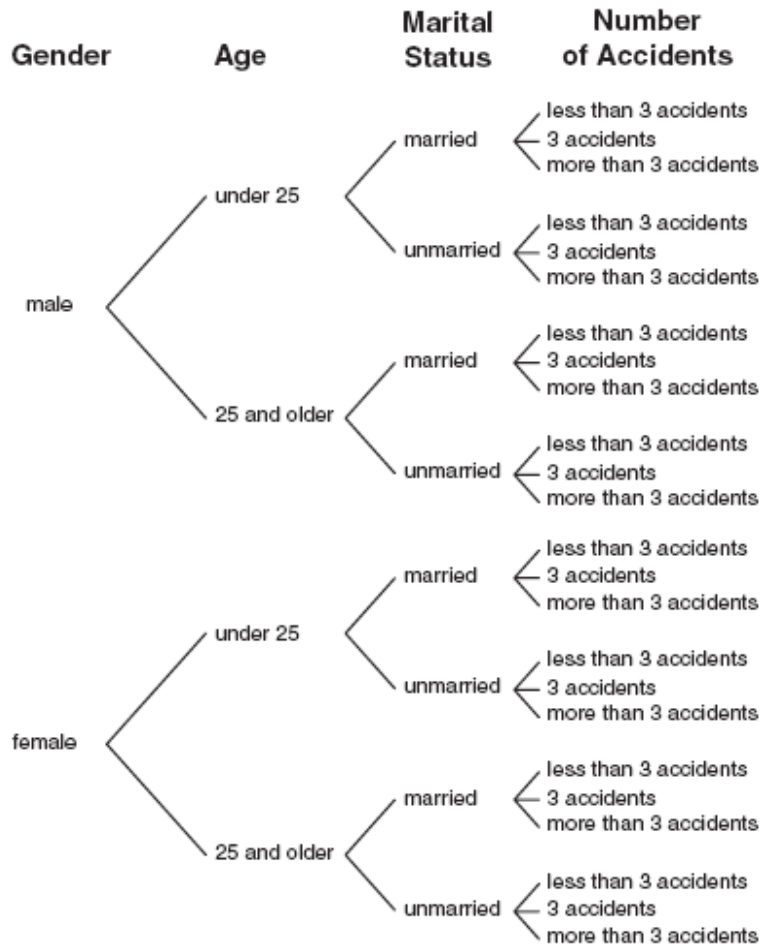
$$\frac{x}{4} = \frac{x+1}{3}$$

- A** $x = -4$
 - B** $x = -1$
 - C** $x = \frac{1}{7}$
 - D** $x = \frac{4}{7}$
- 29.** Which property of real numbers is illustrated below?

$$x(y + z) = xy + xz$$

- A** Associative Property of Addition
- B** Associative Property of Multiplication
- C** Distributive Property
- D** Commutative Property of Multiplication

30. An insurance actuary used the tree diagram below to help categorize drivers by gender, age, marital status, and accident history. Based on the diagram, how many combinations of gender, age, marital status, and number of accidents are possible?



- A 24
- B 8
- C 6
- D 3

