Word Problems Team Test **School _____**
KCATM 2014

1) A right triangle has legs of length x and $2x + 4$ and a hypotenuse of length $3x - 4$. Find the length of the triangle's longer leg.

A) 4 B) 8 C) 12 D) 24 E) answer not given

2) A couch is originally priced at x dollars, is then marked down by 10% and then marked up by 20%. What is the new price of the couch?

A) $.90x$ B) $.92x$ C) $1.08x$ D) $1.10x$ E) answer not given

3) A company sells widgets. The company's profit in terms of the number of widgets sold is given by the function $P(x) = .08x - (.02x + 600)$. How many widgets must the company sells to break even?

A) 10 B) 100 C) 1000 D) 10000 E) answer not given

4) Car A and Car B leave from Point P at the same time. Car A travels at a constant rate of 80 mph in a due southwest direction, and Car B travels at a constant rate of 60 mph in a due northwest direction. Assuming the cars continue to travel at these same rates in these same directions, how far apart are the cars after 3 hours?

A) 60 mi B) 100 mi C) 300 mi D) 420 mi E) answer not given

5) Car A and Car B leave from Point P at the same time. Car A travels at a constant rate of 80 mph in a due southwest direction, and Car B travels at a constant rate of 60 mph in a due northeast direction. Assuming the cars continue to travel at these same rates in these same directions, how far apart are the cars after 3 hours?

A) 60 mi B) 100 mi C) 300 mi D) 420 mi E) answer not given

6) A farmer wants to enclose a rectangular area next to a river. The farmer is not going to fence along the river and has 400 feet of fencing of available. What is the maximum area he can enclose?

A) 10,000 sq ft B) 20,000 sq ft C) 30,000 sq ft

D) 40,000 sq ft E) answer not given

7) Car A and Car B leave from Point P at the same time. Car A travels at a constant rate of 80 mph in a due southwest direction, and Car B travels at a constant rate of 60 mph in a due west direction. Assuming the cars continue to travel at these same rates in these same directions, how far apart are the cars after 3 hours? Round your answer to the nearest mile.

A) 130 mi B) 140 mi C) 150 mi D) 160 mi E) answer not given

For questions 8-10, a projectile is launched from an initial height of 112 feet. The postion of the particle at time t is given by the formula $s(t) = -16t^2 + 96t + 112.$

8) After how many seconds will the projectile reach its maximum height?

A) 2 sec B) 3 sec C) 4 sec D) 5 sec E) answer not given

9) What is the maximum height of the projectile?

A) 256 ft B) 260 ft C) 264 ft D) 268 ft E) answer not given

10) After how many seconds does the projectile hit the ground?

A) 6 sec B) 7 sec C) 8 sec D) 9 sec E) answer not given

11) The pressure and volume of a gas are inversely related. If the pressure is 30 atmospheres when the volume of the gas is 6 liters, find the volume of gas when the pressure is 9 liters.

A) 15 atm B) 20 atm C) 30 atm D) 45 atm E) answer not given

12) How long will it take for money to double if the money is placed into an account at 10% interest compounded continuously? [Round your answer to the nearest year]

A) 7 years B) 8 years C) 9 years D) 10 years E) 11 years

13) If an object weighs *m* pounds at sea level, then its weight *W* (in pounds) at a height of *h* miles above sea level is given approximately by $W(h) = m\left(\frac{4000}{4000+h}\right)^2$. If Amy weighs 150 pounds at sea level, how much will she weigh on Pike's Peak, which is 14,110 feet above sea level?

A) 149.2 lb B) 149.4 lb C) 149.6 lb D) 149.8 lb E) 150.1 lb

14) The relationship between the Fahrenheit and Celsius temperature scales is given by the formula $F = \frac{9}{5}C + 32.$ The relationship between the Celsius and Kelvin temperature scales is given by the formula $K = C + 273.$ Find the Kelvin temperature that corresponds to a Fahrenheit temperature of 50 degrees.

A) 283 B) 293 C) 303 D) 313 E) 323

15) The period T (in seconds) of a simple pendulum is a function of its length l (in feet) defined by the equation $T = 2\pi\sqrt{\frac{l}{g}}$, where g is 32.2 feet per second per second and is the acceleration due to the gravity. If a pendulum has a period of 20 seconds, how long is the pendulum? [Round your answer to the nearest foot].

A) 316 ft B) 326 ft C) 336 ft D) 346 ft E) 356 ft

16) An equilateral triangle is inscribed in a circle of radius r. Express the circumference of the C of the circle as a function of the length x of a side of the triangle.

A) $\frac{\pi x\sqrt{3}}{3}$ B) $\frac{2\pi x\sqrt{3}}{3}$ C) $\frac{\pi x\sqrt{2}}{2}$ D) $\frac{3\pi x\sqrt{3}}{2}$ E) None of the Above

17) Find the point on the line $y = x$ that is closest to the point (3, 1).

A) (1.5, 1.5) B) (1.75, 1.75) C) (2, 2)

D) (2.25, 2.25) E) (2.5, 2.5)

18) A rectangle has two vertices on the graph of $y = 10 - x^2$, one on the negative x-axis, and one on the positive x-axis. Find the largest area A that can be enclosed by the rectangle. Round your answer to the nearest hundredth.

A) 12.17 B) 16.48 C) 20.19 D) 24.34 E) 27.21

19) A circle with radius 5 is centered at (7, -1). Which of the following points is on the circle?

A) (6, -2) B) (5, -3) C) (5, -5) D) (4, -5) E) (5, 4)

20) How much water must be evaporated from 33 ounces of a 4% salt solution to make a 6% solution?

A) 5 ounces B) 7 ounces C) 9 ounces D) 11 ounces E) 13 ounces

21) The intensity (I) (in candlepower) of a certain light source is inversely related to the square of x, where x is the distance (in meters) from the light. If an object that is 2 meters from the light produces an intensity of 225 candlepower, how far must an object be to produce an intensity of 100 candlepower?

A) 3 meters B) 4.5 meters C) 6 meters D) 9 meters E) answer not given

22) In his anthropology class, George's final exam counts for 40% of his grade. He averaged a 91% on the other 60% of his coursework. What grade must George get on the final to end with at least a 90% average?

A) 87% B) 87.5% C) 88% D) 88.5% E) 89%

23) A football team scores 32 points in a game, either all by field goals (3 points) or by touchdowns with extra point (7 points). If the team scores 4 more field goals than touchdowns, how many field goals did the team make?

A) 4 B) 5 C) 6 D) 7 E) 8

24) A hot-air balloon is flying due east at a constant speed of 15 miles per hour at a constant altitude of 5300 feet. At time t = 0, the balloon is directly above an intersection. How far is the balloon from the intersection after 10 minutes? [Round your answer to the nearest hundred feet]

A) 13,800 ft B) 13,900 ft C) 14,000 ft

D) 14,100 ft E) 14,200 ft

Word Problem TEAM Test Answers 2014

1) **D**
2) **C**
3) **D**
4) **C**
5) **D**
6) **B**
7) **E**
8) **B**
9) **A**
10) **B**
11) **B**
12) **A**
13) **D**
14) **A**
15) **B**
16) **B**
17) **C**
18) **D**
19) **D**
20) **D**
21) **A**
22) **D**
23) **C**
24) **E**