

- 1) Marie is taking a class where her grade is based entirely on five equally weighted exams. She scored 80, 88, 93, and 84 on her first 4 exams. What score does Marie need on her fifth test to maintain at least an average of 80?
- A) 35 B) 45 C) 55 D) 65 E) 75
- 2) How many milliliters of 80% acid must be added to 100 mL of 50% acid to bring the solution's concentration to 77% acid?
- A) 400 B) 500 C) 600 D) 800 E) 900
- 3) Emily is 65 feet above ground level in a hot air balloon, moving straight up at 1 foot per second, when Mike passes underneath the balloon on his bicycle, moving at 17 feet per second. Three seconds after Mike passes underneath Emily, how far apart are Mike and Emily? If necessary, round your answer to the nearest mile.
- A) 82 B) 83 C) 84 D) 85 E) 86
- 4) The price of a product, p , is increased by 30% and then the price is decreased by 30%. What is the new price?
- A) p B) $.91p$ C) $1.09p$ D) $.96p$ E) $1.04p$
- 5) A projectile is launched from ground level such that its height at time t is given by the equation $h(t) = -16t^2 + 80t + 96$. Find the maximum height of the projectile.
- A) 196 ft B) 180 ft C) 212 ft D) 228 ft E) 164 ft
- 6) A plant grows at a constant rate of 4 inches per month. If the plant is currently 4 feet, 7 inches tall, how tall will it be in 7 months?
- A) 6'11" B) 5'9" C) 7'1" D) 5'11" E) 6'1"
- 7) A Ferris Wheel makes one complete revolution in 96 seconds. If the center of the wheel is located 35 feet off of the ground, and the diameter of the wheel is 64 feet, how long after reaching the bottom will a rider be 51 feet off of the ground. If necessary, round your answer to the nearest second.
- A) 29 seconds B) 30 seconds C) 31 seconds D) 32 seconds E) 33 seconds
- 8) A barn contains only cows and chickens. If the barn contains 24 animals, and 76 legs, how many chickens are in the barn?
- A) 6 chickens B) 7 chickens C) 8 chickens D) 9 chickens E) 10 chickens
- 9) A ball is dropped from a height of 10 feet. If the ball returns to 90% of its previous height on each bounce, how far will the ball travel?
- A) 180 feet B) 190 feet C) 200 feet D) 100 feet E) 110 feet

- 10) The temperature (in degrees Kelvin) and pressure (in atmospheres) of a gas vary directly. If a temperature of 400 degrees Kelvin corresponds to a pressure of 104 atmospheres (atm), then what pressure would be expected of a gas with temperature 500 degrees Kelvin.
- A) 104 atm B) 130 atm C) 83.2 atm D) 128 atm E) 85 atm
- 11) A colony of 20 bacteria increases by 50% every hour. How many bacteria will be present after 10 hours? If necessary, round your answer to the nearest whole number.
- A) 120 B) 650 C) 1153 D) 1271 E) 1301
- 12) A plane travels due west at a constant speed of 180 miles per hour. The wind is out of the southeast at 27 miles per hour. Find the ground speed of the plane. If necessary, round your answer to the nearest whole number.
- A) 153 mph B) 157 mph C) 159 mph D) 162 mph E) 165 mph
- 13) A cone has a radius of 10 feet and a height of 80 feet. If the cone is filled with 40 feet of water, find the volume of the remaining space in the cone. If necessary, round your answer to the nearest whole number. All answers given are in cubic feet.
- A) 7300 cu ft B) 7310 cu ft C) 7320 cu ft D) 7330 cu ft E) 7340 cu ft
- 14) An airplane takes off 8000 feet from the end of a runway. The plane maintains a constant angle and crosses the end over the end of the runway when it is 800 feet off of the ground. Find the plane's angle with the ground. If necessary, round your answer to the nearest whole number.
- A) 3 degrees B) 4 degrees C) 5 degrees D) 6 degrees E) 7 degrees
- 15) A car starts at point A and travels 100 miles due north to point B. The car then travels southeast for 80 miles until it reaches point C. How far is point A from point C? If necessary, round your answer to the nearest whole number.
- A) 160 miles B) 166 miles C) 172 miles D) 175 miles E) 180 miles
- 16) Four consecutive odd integers have a product of 19305. Find the sum of the four integers.
- A) 48 B) 56 C) 64 D) 72 E) 80
- 17) Three numbers have a mean of 37. If the median of the numbers is 12, and the largest number is 79 greater than the smallest number, find the largest number.
- A) 99 B) 89 C) 84 D) 94 E) 104
- 18) Alex can perform a job in 7 hours. Corey can do the same job in 9 hours. Working together, how long will it take Alex and Corey to complete the job? If necessary, round your answer to the nearest tenth of an hour.
- A) 3.6 hours B) 3.7 hours C) 3.8 hours D) 3.9 hours E) 4 hours

- 19) A train leaves Kansas City for St. Louis (250 miles), and completes the trip in 4 hours. A car takes the exact same path, travelling at an average rate 13 miles per hour faster than the train. How long will it take the car to make the trip? If necessary, round your answer to the nearest minute.
- A) 3 hrs 15 min B) 3 hrs 16 min C) 3 hrs 17 min D) 3 hrs 18 min E) 3 hrs 19 min
- 20) A package dropped from 1000 feet falls according to the equation $h(t) = -16t^2 + 1000$, where t is measured in seconds, and h is measured in feet. When will the package hit the ground? If necessary, round your answer to the nearest tenth of a second.
- A) 7.7 seconds B) 7.8 seconds C) 7.9 seconds D) 8.0 seconds E) 8.1 seconds
- 21) Florence wants to sod a triangular piece of land. If the piece of land has sides measuring 4 feet, 6 feet, and 8 feet, and the sod costs \$2.85 per square foot, how much will it completely sod the land? If necessary, round your answer to the nearest cent.
- A) \$34.20 B) \$33.71 C) \$33.11 D) \$32.50 E) \$31.81
- 22) Steve walks 2.3 miles west, 1.2 miles north, 0.8 miles east, and 0.2 miles north. How far is Steve from where he started? If necessary, round your answer to the nearest hundredth of a mile.
- A) 2.03 miles B) 2.04 miles C) 2.05 miles D) 2.06 miles E) 2.07 miles
- 23) If the geometric mean of two numbers is $\sqrt{24}$ and the arithmetic mean of the same two numbers is 5, find the smaller of the two numbers.
- A) 1 B) 2 C) 3 D) 4 E) 5
- 24) The temperature in Kansas City, x days into July can be estimated using the function, $f(x) = 8\cos(.96x) + 83$. According to the function, what is the maximum temperature that can be reached?
- A) 75 B) 79 C) 83 D) 87 E) 91
- 25) There are 7 gaggles in 2 giggles, 3 giggles in a piggles, and 2 piggles in a quiggle. How many gaggles are in 4 piggles? (84 piggles)
- A) 84 B) 168 C) 336 D) 42 E) 21