College Math Exam 2 Name_____

Show all necessary work leading to your answers.

1. An air conditioning system can circulate 530 cubic feet of air per minute. How many cubic yards can it circulate per minute?

2. Convert 23 gallons to quarts.

3. A dog kennel uses 45 pounds of dog food per day. How many pounds are used in one year?

4. How many cords of wood could you fit in a room that is 7 yards long, 7 yards wide, and 6 yards high? Use the fact that 1 cord = 128 ft^3 and 1 yd^3 = 27 ft^3

5. Convert the following quantity…

14 quarts = _____liters

6. How many British pounds can you purchase with $90?

7. Find the absolute and the relative change (as a percent) for the following situation…

   The number of daily news paper in a country was 2640 in 1900 and 1390 in 2010.

   a) Absolute change:

   b) Relative change:

8. State the number of significant digits and the implied precision of the given number.

$$1.864\times10^{4}\ \text{seconds}$$

   a) the number 1.864×10^{4} has _____ significant digits.

   b) What is the implied precision of the number $1.864\times10^{4}\ \text{seconds}$? (Circle one)

   Precise to the nearest second Precise to the nearest thousand seconds

   Precise to the nearest hundred seconds Precise to the nearest ten seconds

9. Find the absolute and relative error for the following situation…

   The diameter of a gear must be 24.9 centimeters in order for it to fit into a transmission. Instead it is manufactured with a diameter of 24.76 centimeters.

   a) The absolute error is _____ centimeters.

   b) The relative error is _____%.

10. Carry out the indicated operation and give your answer with 2 significant digits.

$$239.88 \div 0.068$$

11. Suppose we weigh a car at 2100lbs. Using the rounding techniques we discussed in class, determine how much the car would weigh if we place a 20lb bowling ball and a 3lb book in the trunk.

12. Convert 1.45×10^{-4} into ordinary numbers.

13. Convert 5700 into scientific notation.

14. Calculate the Net Cash Flow. Assume 1 month = 4 weeks.

Income	**Expenses**
Part-time job: $600/month	Rent: $450/month
College fund from grandparents: $400/month	Groceries: $50/week
Scholarship: $5000/year	Tuition and fees: $3000 twice a year
	Incidentals: $100/week

15. Find the monthly interest payment if you maintain an average balance of $675 on your credit card, which carries a 24% annual interest rate.

16. Use the appropriate compound interest formula to compute the balance of $12,000 that is invested for 5 years with an APR of 4% and is compounding quarterly.

17. If someone is 24 years old, deposits $1000 each year into a traditional IRA (individual retirement account) for 46 years at 7% interest, compounded annually, and retires at age 70, how much money will be in the account upon retirement?

18. Compute the total and annual return on a four year investment that you pay $3100 for shares in a startup company that returns $1400 (a loss) when you sell the shares.

a) The total return is _____%.

b) The annual return is _____%.

19. Consider a home mortgage of $225,000 at a fixed rate of 9% for 15 years.

    a) Calculate the monthly payment.

    b) Determine the total amount paid over the term of the loan.

    c) How much was paid in interest?

20. Calculate the amount of money you'll have at the end of 10 years if you invest in an account paying 3% simple interest.

Bonus: Sam wanted to compute the monthly payment on his student loan, but made an error. Below are his computations. Explain what the problem is in his work. Note: He original loan amount was for $15,000 at a 6% APR and he structured the loan to be paid monthly over 10 years.

$$\text{PMT} = \frac{15000\left(\frac{0.06}{12}\right)}{\left[1-\left(1+\frac{0.06}{12}\right)^{-12(10)}\right]} \quad (1)$$

$$\text{PMT} = \frac{15000(0.005)}{\left[1-(1+0.005)^{-120}\right]} \quad (2)$$

$$\text{PMT} = \frac{75}{\left[1-(1.005)^{-120}\right]} \quad (3)$$

$$\text{PMT} = \frac{75}{[1-0.5496]} \quad (4)$$

$$\text{PMT} = \frac{75}{0.4504} \quad (5)$$

$$\text{PMT} = \$166.52 \quad (6)$$

Line number _____ has the error. It is a _____ error.

Sam should have or shouldn't have:

Some Helpful Things

$1.414 = 1 British pound	0.7072 British pounds = $1
$0.7834 = 1 Canadian dollar	1.277 Canadian dollars = $1
$1.256 = 1 Euro	0.7965 Euro = $1
$0.01007 = 1 Japanese Yen	99.34 Yen = $1
$0.06584 = Mexican peso	15.19 Pesos = $1
1inch = 2.54 centimeters	1 foot = 12 inches
1 yard = 3 feet	1 rod = 5.5 yards
1 fathom = 6 feet	1 mile = 1760 yards = 5280 feet
1 foot = 0.3048 meters	1 meter = 3.28 feet
1 yard = 0.9144 meters	1 meter = 1.094 yards
1 mile = 1.6093 kilometers	1 kilometer = 0.6214 miles
1 lb = 0.4536 kilograms	1 kilogram = 2.205 lb
1 fl oz = 29.574 mL	1 mL = 0.03381 fl oz
1 quart = 0.9464 L	1 L = 1.057 quarts
1 gallon = 3.785 L	1 L = 0.2642 gallons

$$A = P \times (1 + APR)^{Y}$$

$$A = P \times \left(1 + \frac{APR}{n}\right)^{(nY)}$$

$$A = P \times e^{(APR \times Y)}$$

$$A = PMT \times \frac{\left[\left(1 + \frac{APR}{n}\right)^{(nY)} - 1\right]}{\left(\frac{APR}{n}\right)}$$

$$PMT = \frac{P \times \left(\frac{APR}{n}\right)}{\left[1 - \left(1 + \frac{APR}{n}\right)^{(-nY)}\right]}$$