Skill Topics     

Application Topics    

Resources     

Math OER

Math 52 Final

Still under Development! Trust nothing here! Why are you looking at this?

Name:	Date:

*Calculators **are** allowed. Notes **are** allowed.*
Reduce fraction answers. No need to change improper fraction answers to mixed numerals.
Turn in a page with your own numbered step-by-step answers.

1. Reduce the fraction $^{18}/_{30}$

2. Find $^{10}/_{18} \div {}^{2}/_{3}$

3. Find the sum of $^{1}/_{2}$, $^{3}/_{4}$, and $^{9}/_{5}$ using common denominators.

4. Estimate the division problem $86 \div 90.6$ by rounding both numbers to the nearest tens place.

5. Simplify: $2{,}696.906 \times 100$

6. Brand A costs $12.13 for 18 ounces. Brand B costs $16.81 for 22 ounces. What is the price per ounce for each? Which is the better buy?

7. Simplify: $5 \times (6 + 36 \times 6) + 5 - 1 + 81 \div 3^2 \times 2^3$

8. Simplify: $^{51}/_{7} - [-4\ ½ \times (-3\ ⅓ \div 2\ ⅓)\ ]$

9. Change the temperature 64 degrees Fahrenheit into degrees Celsius.

10. Your friend is a 44-year-old minimally active woman who weighs 103 pounds and is 4 feet 11 inches tall. What is her estimated BMR?

11. Solve: $110 \div q = 5$

12. A number divided by 126 equals 14. What is the number?

13. Solve: $\frac{63}{10} = \frac{n}{63}$

14. The vet gives Jane a 2750 ounce bag of dinosaur food containing 44 milligrams of medicine. Jane needs to give her dinosaur a dose of 5.5 milligrams of medicine. How many ounces of that dinosaur food should she feed her dinosaur?

15. A respiratory therapist is administering oxygen to a patient. Each tank has 400 mL of oxygen at a pressure of 700 mmHg. Her equipment reduces the pressure the patient recieves to 500 mmHg. Use Boyle's Law to find the volume provided by each tank.

16. A graph of a line goes through the points (10, 15) and (14, 19). What is the slope of this line?

17. Write 82.22 in percent format.

18. 308.04 is what percent of 906?

19. The sales tax rate in Superbia City is 6%. How much sales tax is put on an item costing $940?

20. A certain car depreciates in value 25% during its first year. That car is worth $25,000 after its first year. What was its original cost?

21. Complete this quantity-value table.

Item	Grams	Grams %	Calories	Calories %
Fat	14 grams			
Carbohydrate			76 calories	
Protein	3 grams			

22. The tallest skyscraper in Superbia City is 940 meters tall. How many feet is this? (1 meter is about 3.281 feet.)

23. How many inches are in 13 yards?

24. The average distance between Moondoes Coffee Shops is 2,662 meters. How many kilometers is this? Do not round your answer.

25. Stalwart the Wonder Snail crawls 52 yards in 4.6 minutes. Express this speed in miles per hour.

26. A patient named Wesley has a weight of 52 kilograms. A drug should be administered at 0.16 mg per kilogram. The supply has a concentration of 1.1 g per 29 milliliters. How many mL of volume should be administered?

27. Find the molarity of 406 grams of NaI in 662 mL of solution, given the molecular weight of NaI is 149.89 grams per mole.

28. Write the number $1.00953125 \times 10^{13}$ as a normal number without scientific notation. How many significant digits does it have?

29. Tannis the chemist bubbles enough HBr into a liter of distilled water to add 0.0000026 moles of H^+ to the water's baseline amount. Find the solution's total H^+ molarity and its pH.

30. A cylinder has a diameter of 6 centimeters, a height of 36 millimeters, and a density of 9.4 grams per cubic centimeter. Find the cylinder's mass (in grams).

Show Answers

1. Divide both top and bottom by 6 to get $^{3}/_{5}$

2. First flip the second fraction change division to multiplication: $^{10}/_{18} \times {}^{3}/_{2}$

Then cancel the top right and bottom left: $^{5}/_{18} \times {}^{3}/_{1}$

Then cancel the bottom right and top left: $^{5}/_{6} \times {}^{1}/_{1}$

Then multiply the fractions to find the final answer of $^{5}/_{6}$.

3. The common denominator is 20. We add $^{10}/_{20} + {}^{15}/_{20} + {}^{36}/_{20} = {}^{61}/_{20}$.

4. $90 \div 90 = 1$

5. 2 scoots to the right gives an answer of **269,690.6**

Note: The previous problem is sometimes displayed wrong due to floating point arithmetic.

6. Brand A costs $0.67 per ounce. Brand B costs $0.76 per ounce. **Brand A** is the better buy.

7. The amount in the parenthesis simplifies to 222. So the first term is $5 \times 222 = 1110$.

The second and third terms are plain numbers: add 5 and subtract 1.

The fourth term involves two exponents. The first part becomes $81 \div 9 = 9$. The second exponent equals 8. Then $9 \times 8 = 72$.

Thus the entire list of terms is 1110 + 5 − 1 + 72 = **1186**.

8. The inner parenthesis becomes $-\frac{10}{7}$ and then the bracket amount becomes $\frac{45}{7}$. The final subraction step results in $\frac{6}{7}$

9. To change from Fahrenheit to Celsius we use the formula C = (F − 32) ÷ 1.8. So 64 degrees Fahrenheit becomes about **17.8 degrees Celsius**.

10. A woman's BMR = (weight × 4.55) + (height × 15.88) − (age × 5) + 5
= (103 × 4.55) + (59 × 15.88) − (44 × 5) + 5 ≈ **1,191 calories per day**.

11. Divide both sides by 5 to get q = **22**

12. Rewrite the word problem as the equation $z \div 126 = 14$. To get z by itself we multiply both sides by 126. The answer is **1764**.

13. $n = 63 \times 63 \div 10 \approx$ **396.9**

14. There are 2750 ÷ 44 = 62.5 ounces of dinosaur food for each milligram of medicine. So Jane needs to give her dinosaur about 5.5 × 62.5 = **344 ounces** of dinosaur food.

15. The product of the tank's volume and pressure is 400 mL × 700 mmHg = 280,000, so the new volume will be that product divided by the new pressure of 500 mmHg, resulting in **560 mL**.

16. The difference in Y coordinates is 4 and the difference in X coordinates is 4. We divide to find the slope of **1.00**.

17. Use RIP LOP and scoot the decimal point twice to the right to get **8,222%**

18. Translate the percent sentence as $308.04 = y \times 906$. Solve for y by dividing both sides by 906. The answer is **34%**.

19. We can rephrase the question using the word *of* to show that we should multiply: *What is 6% of $940?* Then 0.06 × $940 = **$56.40**.

20. Change the word problem into a percent sentence by asking *$25,000 is 75% of what?* Then translate the percent sentence as $25{,}000 = 0.75 \times y$. Solve for y by dividing both sides by 0.75 to get an answer of **$33,333**.

21. Here is the completed table.

Item	Grams	Grams %	Calories	Calories %
Fat	14 grams	39%	126 calories	59%
Carbohydrate	19 grams	53%	76 calories	36%
Protein	3 grams	8%	12 calories	6%

22. There are about 3.281 feet in one meter. So 940 meters is about equal to 940 × 3.281 ≈ **3,084 feet**.

23. There are 3 feet in one yard, and 12 inches in one foot. So 13 yards is equal to 13 × 3 × 12 = **468 inches**.

24. There are 1,000 meters in one kilometer. So 2,662 meters is equal to **2.662 kilometers**.

25. When we use Unit Analysis we find out we need to multiply by 3 (to change from yards to feet), divide by 5,280 (to change from feet to miles), and multiply by 60 (to change from minutes to hours).

$$\frac{?\text{ yards}}{??\text{ minutes}} \cdot \frac{3\text{ feet}}{1\text{ yard}} \cdot \frac{1\text{ mile}}{5{,}280\text{ feet}} \cdot \frac{60\text{ minutes}}{1\text{ hour}}$$

If we round to the nearest hundredth, we get **0.39 miles per hour**.

26. Use unit analysis: the patent's weight,body surface area will be multiplied by the drug's administration rate and divided by the drug's concentration. All the units will cancel except for milliliters. The answer is **21.93 millilers**

27. Use unit analysis: the first rate is the grams of chemical per volume of solution. This is divded by the molarity. The result is multiplied by 1,000 mL per liter. The answer is about **4.1 moles per liter**

28. After scotting the decimal 13 times we get the number **10095312500000**, which has **9 significant digits**.

29. The water starts with an H^+ molarity of 0.0000001. We find the sum of that and the 0.0000026, which is 0.0000027. Then we take the logarithm, which is about -5.57. The pH is the negative of this, which is **5.57**

30. The cylinder's circular edge has an area of about 28.3 square centimeters. Change the height into centimeters and then multiply to get a volume of about 101.8 square centimeters. Then multiply by the density to get **957 grams**