

Week in Review # 11

MATH 365

Sections 4.4-6.1

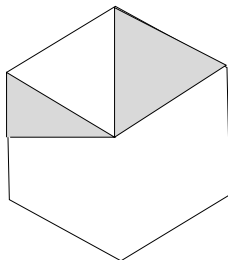
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Created and compiled by Sherry Scarborough with thanks for additional problems from Zach Barcevac, Lynnette Cardenas, Greg Klein, David Manuel, Jane Schielack, and Jenn Whitfield.

1. How many positive divisors does $3^7 \cdot 5 \cdot 7^4$ have?
2. If a , b , c , and d are non-zero real numbers, give all proportions (do not include any multiples of your proportions) that result in, if, and only if, $ab = cd$.
3. Insert three rational numbers between $\frac{7}{15}$ and $\frac{7}{9}$.
4. Use two different methods to find the greatest common divisor of 910 and 1547.
5. Write 5.834 in expanded place-value form.
6. Name one property that applies to rational numbers that does not apply to integers.
7. Use division by primes to find the lcm (16, 85, 240).
8. What is $\frac{5}{3} \div 0$ and why?
9. Explain lcm to me.
10. The ratio of boys to girls in a class is 5 to 8. Will the ratio of boys to girls stay the same, become greater, or become smaller if 3 boys and 3 girls leave the class. Justify your answer.
11. A can of Pringles' Potato Chips contains 198 grams. According to the nutrition label, there are 77 grams of fat in the entire can. Use a common fraction to estimate what fraction of the chips are fat grams. Justify your answer.
12. Prime factor 102.
13. Given 1.392
 - a. What is its fractional meaning?
 - b. What is its common mixed-number notation?
 - c. What is its common improper-fraction notation?
14. Find the remainder when 2^{29} is divided by 4.
15. If 203 is prime, write "prime", otherwise find its prime factorization.
16. How many positive divisors does 342 have?
17. State the Fundamental Theorem of Arithmetic.
18. If a is a natural number, find $\gcd(a^2, a^5)$ and $\text{lcm}(a^2, a^5)$.
19. Find a rational number between $\frac{3}{8}$ and $\frac{2}{5}$.

20. You purchase 1 share of Dell stock at $48\frac{3}{8}$ dollars per share. The next day the stock goes up $3\frac{1}{4}$ dollars per share. What is the value of the investment now?
21. Using the Fundamental Law of Fractions, find three distinct fractions equivalent, but in different form than, $\frac{6}{13}$.
22. Given that the entire shape represents one unit area, write a fraction in lowest terms that represents the shaded portion.



23. Arrange $\frac{-23}{90}, \frac{-13}{45}, \frac{-3}{10}, -1, \frac{-1}{4}$ in increasing order.
24. Model $1\frac{1}{2} + \frac{2}{3}$.
25. Change $-9\frac{3}{8}$ to a fraction of the form $\frac{a}{b}$, where a and b are integers, such that $b \neq 0$. Show your work and do not just use a rule or property.
26. State the Fundamental Law of Fractions and then give an example illustrating this law.
27. Find a number that has only five positive divisors.
28. Define prime number.
29. Represent $\frac{3}{4}$ by shading a common geometric figure.
30. Simplify:
- $6\frac{4}{5} + 7\frac{2}{3} - 1\frac{11}{20} =$
 - $\frac{20xy^2}{15x^2y - 10xy} =$
31. Change $\frac{858}{154}$ to a mixed number in lowest terms.
32. If $n|m$, find $\gcd(n, m)$.
33. Use the definition of less than to prove $\frac{-3}{4} < \frac{-6}{11}$.
34. What is the greatest prime you need to check to see if 923 is prime?
35. Find the additive inverse of $-3\frac{6}{7}$ as an improper fraction in lowest terms.

36. Insert seven fractions between 5 and 12 so that the nine numbers together constitute an arithmetic sequence.
37. A school claims to have 2 teachers for every 25 students. If the school has 500 students, how many teachers should they employ?
38. A theater offers group tickets. Five tickets can be purchased for \$17, or 12 tickets can be purchased for \$39. Which offer is the better deal?
- scaling strategy (find the price for the same number of tickets).
 - unit-rate price (find the price per ticket).
39. If p and q are distinct primes, find $\gcd(p^5, q)$.
40. A map has a scale of 2 inches = 75 miles. You measure the distance between two cities on the map as 25 inches. If you were to fly from one city to the other in a straight-line path, how many miles would you travel?
41. Estimate: $2\frac{1}{99} - 3\frac{1}{48} + 6\frac{13}{25}$
42. True or False:
- $(a + b)^{-1} = \frac{1}{a} + \frac{1}{b}$ if $a \neq 0, b \neq 0$
 - $3^0 = 0$
43. Are the following terminating or repeating decimals? Explain.
- $\frac{3}{20}$
 - $\frac{12}{35}$
 - $\frac{6}{15}$
44. Fully simplify: $\frac{\frac{2}{3} + \frac{7}{15}}{\frac{1}{6} - \frac{3}{10}}$
45. Name two composite triple-digit numbers that are relatively prime.
46. Paige paid \$45 (not including tax) for a pair of shoes that were marked " $\frac{1}{3}$ off." What was the original cost of the shoes?
47. Use two different methods to find the least common multiple of 2430 and 3150.
48. Write in words the proper way to say: 5.639
49. In water, H_2O , the ratio of the weight of oxygen to the weight of hydrogen is approximately 8:1. How many ounces of hydrogen are in five pounds of water?
50. Model: $\frac{2}{3} + \frac{3}{5}$
51. Write $5 \cdot 10^3 + 7 \cdot 10^0 + 8 \cdot 10^{-2} + 3 \cdot 10^{-3} + 9 \cdot 10^{-5}$ as a decimal.
52. Find $\gcd(6,4)$ and $\text{lcm}(6,4)$.

53. Fully simplify $\frac{(a-b)^{-4}(b^2-a^2)}{(a-b)}$ using only positive exponents in the final answer.
54. Use a rectangular region to model and find the product $\frac{4}{5} \cdot \frac{1}{3}$.
55. The electrical resistance r of a wire, measured in ohms Ω , is equal to a constant times the length of the wire. If the electrical resistance of a five-foot wire is 4.2Ω , what is the resistance of 18 feet of the same wire?
56. Prove: $\frac{m}{n} \div \frac{t}{u} = \frac{mu}{nt}$ where $n, u, t \neq 0$.
57. Using the rectangular model, illustrate and compute $\frac{2}{3} \div \frac{1}{4}$.
58. Find $\left(2\frac{3}{4}\right)\left(6\frac{5}{6}\right)$ as an improper fraction in lowest terms.
59. Jeopardy: Andy owns 3 and $\frac{1}{2}$ acres and just purchased an adjacent plot of $\frac{3}{4}$ acre. The answer is 4 and $\frac{1}{4}$. What is the question?
60. Use base-ten blocks to illustrate
- 2.31 using a flat as a unit
 - 1.142 using a block as a unit
61. Order the decimals from least to greatest: 0.375 0.3748 0.3747
62. Find the multiplicative inverse.
- $\frac{-7b}{a^2}$ where $a, b \neq 0$.
 - $\frac{3}{4}$
63. Write each of the following in simplest form using positive exponents in the final answer. Assume all expressions are defined.
- $\left(\frac{ac}{bc^2}\right)^{-1} \cdot \left(\frac{b}{a^2c^{-1}}\right)^5$
 - $\frac{(a-p)^{-3}(p-a)^{-8}}{(p-a)^{-5}}$
 - $\frac{(yz^5)^{-4}(y^2x^{-2})^3}{(z^{-1})(x^2z^4)^6}$
 - $\left(\frac{-8qs^2}{14s}\right) \cdot \left(\frac{7q}{56s}\right)$
 - $\frac{25^{999} - 5^{2000} \cdot 5^0}{125^3 \cdot 5^{1992} + 25^{1000}}$