

Math 01 Sample Final A –**SOLUTIONS**

Evaluate the expression in problems 1-10. Each of these is worth 2 points.

1. $15(-7) = -105$

2. $20 - (-14) = 20 + 14 = 34$

3. $-15 + 8 = -7$

4. $40 \div (-8) = -5$

5. $3 - 5 + 8 - 6 - 2 = -2 + 8 - 6 - 2 = 6 - 6 - 2 = 0 - 2 = -2$

6. $\frac{5(-18)}{9} = \frac{5(-2)}{1} = \frac{-10}{1} = -10$

7. $-9^2 = -(9)(9) = -81$

8. $6 - 3(8 - 11) = 6 - 3(-3) = 6 + 9 = 15$

9. $\frac{8-(-2)}{-10+(-8)} = \frac{8+2}{-10-8} = \frac{10}{-18} = -\frac{5}{9}$

10. $\frac{27-4\sqrt{9}}{3} = \frac{27-4(3)}{3} = \frac{27-12}{3} = \frac{15}{3} = 5$

For the rest of the exam, problems are worth 5 points each.

11. Compute

(a) $501,328 - 496,578 = 4750$

$$\begin{array}{r} 501328 \\ - 496578 \\ \hline 4750 \end{array}$$

(b) $6912 \div 36 = 192$

$$\begin{array}{r} 192 \\ 36 \overline{)6912} \\ \underline{-36} \\ 331 \\ \underline{-324} \\ 72 \\ \underline{-72} \\ 0 \end{array}$$

12. Compute and express the result in lowest terms

(a) $\frac{2}{15} + \frac{4}{9} = \frac{2^3}{15_3} + \frac{4^5}{9_3} = \frac{6}{45} + \frac{20}{45} = \frac{26}{45}$

(b) $\frac{12}{13} \div \frac{15}{11} = \frac{12}{13} \times \frac{11}{15} = \frac{132 \div 3}{195 \div 3} = \frac{44}{65}$

13. List the following fractions in order from smallest to largest: $\frac{8}{15}, \frac{3}{5}, \frac{13}{24}$ answer: $\frac{8}{15}, \frac{13}{24}, \frac{3}{5}$

$\text{LCD}(15,5,24) = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5 = 24 \cdot 5 = 120$ $\frac{8^8}{15_8} = \frac{64}{120}$ or ~ 0.53 smallest

$\underline{15} = 3 \cdot 5$; $\underline{5} = 5$; $\underline{24} = 2 \cdot 2 \cdot 2 \cdot 3$ $\frac{3^{24}}{5_{24}} = \frac{72}{120}$ or 0.6 largest

$\frac{13^5}{24_5} = \frac{65}{120}$ or ~ 0.54

14. Compute and express the result as a mixed number

(a) $5\frac{2}{3} - 3\frac{1}{5} = 5\frac{2^5}{3_5} - 3\frac{1^3}{5_3} = 5\frac{10}{15} - 3\frac{3}{15} = 2\frac{7}{15}$

(b) $2\frac{3}{4} \times 3\frac{2}{3} = \frac{11}{4} \cdot \frac{11}{3} = \frac{121}{12} = 10\frac{1}{12}$

15. Solve the proportion: $\frac{8}{9} = \frac{6}{x}$ $8x = 6 \cdot 9$ so $8x = 54$ so $\frac{8x}{8} = \frac{54}{8}$ so $x = 6\frac{6}{8} = 6\frac{3}{4}$ or **6.75**

16. Find:

(a) The GCF of $\{48, 60\} = 2 \cdot 2 \cdot 3 = \mathbf{12}$

$$60 = 2 \cdot 2 \cdot 3 \cdot 5$$

GCF: list all factors they share (have in common)

$$48 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$$

(b) The LCM of $\{15, 50\} = 3 \cdot 5 \cdot 2 \cdot 5 = \mathbf{150}$

$$15 = 3 \cdot 5$$

LCM: list all primes on either list, to the highest power

$$50 = 2 \cdot 5 \cdot 5$$

17. Compute

(a) $8.3 \times 6.14 = \mathbf{50.962}$

$$\begin{array}{r} 614 \\ \times 83 \\ \hline 1842 \\ + 49120 \\ \hline \end{array}$$

50962 now move decimal point so there *three* digits after it

(b) $5.13 \div .15 = \mathbf{34.2}$ $.15 \overline{)5.13}$ move both decimal points till the divisor is an integer: $15 \overline{)513.0}$

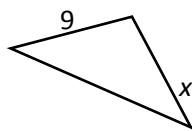
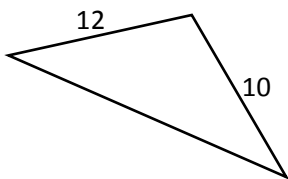
$$\begin{array}{r} 34.2 \\ 15 \overline{)513.0} \\ \underline{-45} \\ 63 \\ \underline{-60} \\ 30 \\ \underline{-30} \\ 0 \end{array}$$

18. Express 0.03 as a percent. **3%**

19. A 50 mile trip requires 4 gallons of gas. How much gas will be needed for a 220 mile trip? Give your answer as a decimal. If necessary, round to the nearest tenth of a gallon.

$$\frac{50 \text{ mi}}{4 \text{ gal}} = \frac{220 \text{ mi}}{x \text{ gal}} \text{ so } 50x = 4 \cdot 220 \text{ so } 50x = 880 \text{ so } \frac{50x}{50} = \frac{880}{50} \text{ so } x = \frac{88}{5} = \mathbf{17.6 \text{ gallons}}$$

20. Given that the two triangles are similar. Find x . $\frac{\text{BIG } \triangle}{\text{little } \triangle} \quad \frac{12}{9} = \frac{10}{x} \text{ so } 12x = 9 \cdot 10 \text{ so } 12x = 90$



$$\text{so } \frac{12x}{12} = \frac{90}{12} \text{ so } x = 7 \frac{6}{12} = 7 \frac{1}{2} \text{ or } \mathbf{7.5}$$

21. 20% of a number is 16. What is the number? If necessary round your answer to one decimal place.

$$\frac{20}{100} = \frac{16}{x} \text{ so } \frac{1}{5} = \frac{16}{x} \text{ so } 1x = 5 \cdot 16 \text{ so } x = \mathbf{80}$$

22. In a class of 40 students 35 pass the final exam. What percentage pass the final exam? **87.5%**

$$\frac{35}{40} = \frac{P}{100} \text{ so } \frac{7}{8} = \frac{P}{100} \text{ so } 8P = 700 \text{ so } P = \frac{700}{8} = 87.5$$

$$[\text{OR: } 35/40 = 0.875 = 87.5\%]$$

23. Evaluate: $2x^2 - 3x - 9$, if $x = -3$ $2(-3)^2 - 3(-3) - 9 = 2(-3)(-3) + 9 - 9 = 18 + 9 - 9 = \mathbf{18}$

24. Given $C = \frac{5}{9}(F - 32)$, Find C, if F=59

$$C = \frac{5}{9}(59 - 32) = \frac{5}{9}(27) = \frac{5}{9} \cdot \frac{27}{1} = \frac{5}{1} \cdot \frac{3}{1} = \frac{15}{1} = 15 \quad \mathbf{15^\circ\text{C}}$$

25. Solve for x: $3x - 17 = 10$

$$\begin{array}{r} 3x - 17 = 10 \\ +17 \quad +17 \\ \hline 3x \quad = 27 \\ \text{then } \frac{3x}{3} = \frac{27}{3} \text{ so } x = \mathbf{9} \end{array}$$

26. The hypotenuse of a right triangle is 10 feet long. If one of the legs is 8 feet long, what is the length of the other leg?

We can use the Pythagorean theorem which states that for right triangles with hypotenuse c and legs a and b :

$$a^2 + b^2 = c^2$$

$$8^2 + b^2 = 10^2$$

$$64 + b^2 = 100$$

now subtract 64 from both sides to get $b^2 = 100 - 64$ so $b^2 = 36$ so $b = \sqrt{36} = \mathbf{6 \text{ feet}}$