

# Los Angeles Southwest College

## Mathematics Department

### MATH 110 – Common Final Exam

#### Practice TEST (rubric)

**Part A: No partial credit will be given to the problems 1 through 10**

1. Perform the indicated operation:  $-18 \cdot \left(-\frac{2}{9}\right)$  (2 pts)

2. Perform the indicated operation:  $-7 - (-10)$  (2 pts)

3. Simplify:  $\frac{5y}{16} + \frac{11y}{16}$  (2 pts)

4. Combine like terms:  $-3x + 5 + 8x - 9$  (2 pts)

5. Perform the indicated operation:  $-2^2$  (2 pts)

6. Perform the indicated operation:  $-|-16|$  (2 pts)

7. Perform the indicated operation:  $-2(-4)(-7)$  (2 pts)

8. Perform the indicated operation:  $-3\sqrt{36}$  (2 pts)

$\boxed{-18}$

9. Simplify:  $-2(3x - 4y + 5)$  (2 pts)

$\boxed{-6x + 8y - 10}$

10. 10. Divide:  $0.58 \overline{)0.7192}$  (2 pts)

$\boxed{1.24}$

**Part B: Partial credit will be given to the problems 11 through 40**

11. Simplify:  $\frac{-3 \cdot (-3)^2 - 5(2 - 7)}{-5^2}$  (4 pts)

a)  $2 - 7 = -5$  1pt

b)  $\left. \begin{aligned} (-3)^2 &= 9 \\ -5^2 &= -25 \end{aligned} \right\}$  1pt

c)  $\left. \begin{aligned} -5 \cdot (-5) &= 25 \\ -3 \cdot (9) &= -27 \end{aligned} \right\}$  1pt

d)  $\frac{-27 + 25}{-25} = \frac{-2}{-25} = \boxed{\frac{2}{25}}$  1pt

12. Find LCM of the set of terms:  $20x^2y^6, 18x^3y, 6x^5y^3$  (4 pts)

$20x^2y^6 = 2^2 \cdot 5x^2y^6$  1pt

$18x^3y = 3^2 \cdot 2x^3y$  1pt

$6x^5y^3 = 3 \cdot 2x^5y^3$  1pt

$LCM = \boxed{2^2 \cdot 3^2 \cdot 5x^5y^6} = \boxed{180x^5y^6}$  1pt

13. Combine like terms:  $-7xy - 10x^2 + 4xy + x^2$  (3 pts)

$-7xy + 4xy - 10x^2 + x^2$  1pt

$\boxed{-3xy} \quad \boxed{-9x^2}$   
 1pt                      1pt

14. Simplify:  $\frac{\frac{11}{12} - \frac{2}{3}}{\frac{5}{6} + \frac{1}{2}}$  (4 pts)

a) LCD=12 1pt      b)  $\frac{12\left(\frac{11}{12} - \frac{2}{3}\right)}{12\left(\frac{5}{6} + \frac{1}{2}\right)}$  1pt

c)  $\frac{11-8}{10+6}$  1pt      d)  $\frac{3}{16}$  1pt

15. Simplify:  $\frac{(3-6)^2 - (7-12)}{(4-6)3 + 2 \cdot 3}$  (4 pts)

$\left. \begin{array}{l} 3-6=-3 \\ 7-12=-5 \\ 4-6=-2 \end{array} \right\} 1pt$      $(-3)^2 = 9$  1pt     $\left. \begin{array}{l} -2 \cdot 3 = -6 \\ 2 \cdot 3 = 6 \end{array} \right\} 1pt$      $\frac{9 - (-5)}{-6 + 6} = \frac{14}{0} = \boxed{\text{undef}}$  1pt

16. Simplify:  $9 - \frac{7}{12} \div \frac{2}{3}$  (4 pts)

$\frac{7}{12} \div \frac{2}{3} = \frac{7}{12} \cdot \frac{3}{2} = \frac{7}{8}$  2pts

$\frac{8}{8} \cdot \frac{9}{1} - \frac{7}{8} = \frac{72}{8} - \frac{7}{8} = \frac{65}{8}$  2pts

17. Simplify:  $\left(1\frac{1}{3} + \frac{1}{2}\right) \cdot \left(3\frac{2}{3} - \frac{1}{2}\right)$  (4 pts)

$1\frac{1}{3} + \frac{1}{2} = \frac{4}{3} + \frac{1}{2} = \frac{4 \cdot 2}{3 \cdot 2} + \frac{1 \cdot 3}{2 \cdot 3} = \frac{8+3}{6} = \frac{11}{6}$  1.5pts

$3\frac{2}{3} - \frac{1}{2} = \frac{11}{3} - \frac{1}{2} = \frac{11 \cdot 2}{3 \cdot 2} - \frac{1 \cdot 3}{2 \cdot 3} = \frac{22-3}{6} = \frac{19}{6}$  1.5pts

$\frac{11}{6} \cdot \frac{19}{6} = \frac{209}{36}$  1pt

18. Evaluate:  $2a^3 - a^2$  for  $a = -2$  (4 pts)

$2(-2)^3 - (-2)^2$  1pt

$2(-8) - 4$  1pt

$$-16 - 4 \quad 1pt$$

$$\boxed{-20} \quad 1pt$$

19. Simplify:  $-2 + 3(-4 - 3 \cdot 2)^2$  (4 pts)

$$-2 + 3(-4 - 6)^2 \quad 1pt$$

$$-2 + 3(-10)^2 \quad 1pt$$

$$-2 + 3(100) \quad 1pt$$

$$-2 + 300 = \boxed{298} \quad 1pt$$

20. Simplify:  $\frac{3xy}{25} \cdot \frac{35}{12x}$  (4 pts)

*1pt for canceling 3 with 12* 1pt

*1pt for canceling 35 with 25* 1pt

*1pt for canceling x with x* 1pt

*1pt for multiplication*  $\boxed{\frac{7y}{20}}$  1pt

21. Combine like terms:  $-2x^2y^3 + 5x^3y^2 - 11x^2y^3 - 9x^3y^2 + 6xy^2$  (3 pts)

$$-2x^2y^3 - 11x^2y^3 + 5x^3y^2 - 9x^3y^2 + 6xy^2 \quad 1pt$$

$$\boxed{-13x^2y^3 \quad -4x^3y^2 \quad +6xy^2}$$

*1pt* *1pt*

22. Multiply:  $-4x(2x^3 - 6x^2 - 7x + 3)$  (4 pts)

$$-4 \cdot 2 \cdot x \cdot x^3 - 4(-6)x \cdot x^2 - 4(-7)x \cdot x - 4 \cdot 3 \cdot x \quad 2pts$$

$$-8 \cdot x \cdot x^3 + 24x \cdot x^2 + 28x \cdot x - 12x \quad 1pt$$

$$\boxed{-8x^4 + 24x^3 + 28x^2 - 12x} \quad 1pt$$

23. Simplify:  $(2x + 5) - (-5x + 3)$  (3 pts)

$$2x + 5 + 5x - 3 \quad 1pt$$

$$2x + 5x + 5 - 3 \quad 1pt$$

$$\boxed{7x + 2} \quad 1pt$$

24. Evaluate:  $10 - 2[-5 - 2^3(-2)]$  (4 pts)

$$\begin{array}{ll} 10 - 2[-5 - 8(-2)] & 1pt \\ 10 - 2[-5 + 16] & 1pt \\ 10 - 2[11] & 1pt \\ 10 - 22 & 0.5pts \\ \boxed{-12} & 0.5pts \end{array}$$

25. Evaluate the expression:  $\frac{3x+4y}{z-2y}$  for  $x=3$ ,  $y=-2$  and  $z=-3$  (4 pts)

$$\begin{array}{ll} \frac{3(3)+4(-2)}{-3-2(-2)} & 1pt \\ \frac{9+(-8)}{-3+4} & 1pt \\ \frac{1}{-3+4} & 1pt \\ \frac{1}{1} = \boxed{1} & 1pt \end{array}$$

26. Perform the indicated operation:  $-\frac{4}{3} \div 2\frac{3}{5}$  (4 pts)

$$\begin{array}{ll} -\frac{4}{3} \div \frac{13}{5} & 2pts \\ -\frac{4}{3} \cdot \frac{5}{13} & 1pt \\ \boxed{-\frac{20}{39}} & 1pt \end{array}$$

27. Evaluate:  $-3\sqrt{16} + 2\sqrt{49}$  (4 pts)

$$\begin{array}{ll} -3 \bullet 4 + 2 \bullet 7 & \\ \quad 1pt \quad 1pt & \\ -12 + 14 & 1pt \\ \boxed{2} & 1pt \end{array}$$

28. Multiply:  $-2y^5 \bullet (7y^3) \bullet (-3y^2)$  (4 pts)

$$\begin{array}{ll} -2 \bullet 7y^5 \bullet y^3 \bullet (-3y^2) & 1pt \\ -14y^8 \bullet (-3y^2) & 1pt \\ -14(-3) \bullet y^8 \bullet y^2 & 1pt \\ \boxed{42y^{10}} & 1pt \end{array}$$

29. Solve the equation:  $\frac{x}{4} - \frac{1}{3} = \frac{x}{12}$  (5 pts)

$$12\left(\frac{x}{4} - \frac{1}{3} = \frac{x}{12}\right) \quad 2pts$$

$$3x - 4 = x \quad 1pt$$

$$\frac{-4}{-2} = \frac{-2x}{-2} \quad 1pt$$

$$\boxed{2 = x} \quad 1pt$$

30. Solve the equation:  $9(x-3) - 13 = 5x + 12$  (5 pts)

$$9x - 27 - 13 = 5x + 12 \quad 1pt$$

$$9x - 40 = 5x + 12 \quad 1pt$$

$$9x - 5x - 40 = 12 \quad 1pt$$

$$9x - 5x = 40 + 12 \quad 1pt$$

$$\frac{4x}{4} = \frac{52}{4} \quad \boxed{x = 13} \quad 1pt$$

31. Solve the equation:  $6.9x - 8.4 = 4.02$  (4 pts)

$$100 \cdot (6.9x - 8.4 = 4.02) \quad 1pt$$

$$690x - 840 = 402 \quad 1pt$$

$$690x = 840 + 402 \quad 1pt$$

$$\frac{690x}{690} = \frac{1242}{690} \quad \boxed{x = 1.8} \quad 1pt$$

32. Solve the equation:  $2.9(x + 8.1) = 7.8x - 3.95$  (5 pts)

$$2.9x + 23.49 = 7.8x - 3.95 \quad 1pt$$

$$100 \cdot (2.9x + 23.49 = 7.8x - 3.95) \quad 1pt$$

$$290x + 2349 = 780x - 395 \quad 1pt$$

$$395 + 2349 = 780x - 290x \quad 1pt$$

$$\frac{2744}{490} = \frac{490x}{490} \quad \boxed{5.6 = x} \quad 1pt$$

33. Solve the equation:  $\frac{5}{2} = \frac{x}{14}$  (4 pts)

$$5 \cdot 14 = 2 \cdot x \quad \frac{5 \cdot 14}{2} = \frac{2 \cdot x}{2} \quad 2pts$$

$$\boxed{35 = x} \quad 2pts$$

34. What percent of 15 is 5? (4 pts)

What percent of 15 is 5?

$$x \bullet 15 = 5 \quad 2pts$$

$$\frac{x \bullet 15}{15} = \frac{5}{15} \quad x = \frac{1}{3} \quad 1pt$$

$$\boxed{x = 33\frac{1}{3}\%} \quad 1pt$$

35. 17 is 25% of what number? (4 pts)

17 is 25% of what number?

$$17 = .25 \bullet x \quad 2pts$$

$$\frac{17}{.25} = \frac{.25 \bullet x}{.25} \quad 1pt$$

$$\boxed{68 = x} \quad 1pt$$

36. A piece of coaxial cable  $\frac{3}{5}m$  long is to be cut into 5 pieces of the same length. What is the length of each piece? (6 pts)

$$x + x + x + x + x = \frac{3}{5} \quad 3pts$$

$$5x = \frac{3}{5} \quad 1pt$$

$$\left(\frac{1}{5}\right)5x = \frac{3}{5}\left(\frac{1}{5}\right) \quad 1pt$$

$$\boxed{x = \frac{3}{25}m} \quad 1pt$$

37. A recipe for muffins calls for  $\frac{2}{3}qt$  (quart) of buttermilk,  $\frac{3}{4}qt$  of skin milk, and  $\frac{1}{6}qt$  of oil. How many quarts of liquid ingredients does the recipe call for? (6 pts)

$$x = \frac{2}{3} + \frac{3}{4} + \frac{1}{6} \quad 3pts$$

$$LCD = 12 \quad 1pt$$

$$x = \frac{8}{12} + \frac{9}{12} + \frac{2}{12} \quad 1pt$$

$$\boxed{x = \frac{19}{12}qt} \quad 1pt$$

38. A rectangular table top measures  $\frac{4}{5}m$  long and  $\frac{3}{5}m$  wide. Find the following: a) it's area and b) it's perimeter. (6 pts)

a)  $A = \text{Length} \cdot \text{Width} \quad A = \frac{4}{5} \cdot \frac{3}{5} \quad 2 \text{ pts}$

$A = \frac{12}{25} m^2 \quad 1 \text{ pt}$

b)  $\text{Perimeter} = 2 \cdot \text{Length} + 2 \cdot \text{Width} \quad P = 2\left(\frac{4}{5}\right) + 2\left(\frac{3}{5}\right) \quad 2 \text{ pts}$

$P = \frac{8}{5} + \frac{6}{5} \quad P = \frac{14}{5} \quad P = 2\frac{4}{5} m \quad 1 \text{ pt}$

39. An ocean liner traveled 408 km in 12 hr. At that rate, how far would the boat travel in 36 hr? (6 pts)

$\frac{408 \text{ km}}{12 \text{ h}} = \frac{x \text{ km}}{36 \text{ h}} \quad 3 \text{ pts}$

$408 \cdot 36 = 12x \quad 1 \text{ pt}$

$\frac{408 \cdot 36}{12} = \frac{12x}{12} \quad 1 \text{ pt}$

$1224 = x \quad x = 1224 \text{ km} \quad 1 \text{ pt}$

40. A lab technician has 850 ml of a solution of water and acid: 3% is acid. How many milliliters are acids? water? (6 pts)

# of milliliters of acid :  $x = 850 \cdot (0.03) \quad 3 \text{ pts}$

$x = 25.5 \text{ ml} \quad 1 \text{ pt}$

# of milliliters of water :  $850 - 25.5 = 824.5 \text{ ml} \quad 2 \text{ pts}$