MTH 086 - Final Exam Review

1. [6.1] Solve: $4 = x + 1$

2. [6.1] Solve: $x + \dfrac{2}{5} = -\dfrac{1}{5}$

3. [5.2] Simplify by using the Distributive Property: $2(6x + 7y)$

4. [5.2] Simplify: $2n - 4(9n - 3)$

5. [4.5] Write as a fraction: $133\dfrac{1}{3}\%$

6. [4.5] Write as a decimal: 45.8%

7. [4.5] Write as a percent: 0.07

8. [6.3] Use the basic percent equation to solve: 75% of 12.5 is what?

9. [4.5] Write as a percent: $\dfrac{3}{20}$

10. [6.3] Use the basic percent equation to solve: 0.45% of 150 is what?

11. [6.3] Solve. Leave a fraction in your answer, if necessary.
    45 is what percent of 70?

12. [2.2] How much colder is the average temperature at 40,000 ft. than at 30,000 ft.?

Cruising Altitude	Average Temperature
12,000 ft	16°
20,000 ft	−12°
30,000 ft	−48°
40,000 ft	−70°
50,000 ft	−70°

13. [2.3] Multiply: $(5)(-1)(-1)$

14. [2.4] Simplify: $4 \cdot (8-4) \div 4$

15. [2.4] Simplify: $12 - 4 \cdot 8 + 4^2 - (-19) - (-8)$

16. [2.4] Evaluate the expression $(b-a)^2 + 4c$ for $a = -5$, $b = 2$, and $c = -9$.

17. [6.3] Use the basic percent equation to solve: Find 10.4% of 775.

18. [6.3] Suppose the number of people working in a certain country in a certain year age 55 or over was 45.2 million. Thirty-five percent of these workers were 65 or older. How many workers were age 65 or older?

19. [6.4] A family reduced its normal monthly gas bill of $55 by $19. What percent decrease does this represent? Round to the nearest tenth of a percent.

20. [6.5] A computer monitor with a regular price of $305 is on sale for 21% off the regular price. Find the sale price. Round to the nearest cent.

21. [6.5] A digital camera costing $115 has a markup rate of 25%. Find the selling price. Round to the nearest cent.

22. [10.2] Multiply: $(5xy^4)(2x^6 y)$

23. [5.3] Translate into a variable expression: the total of twice v and 8

24. [4.3] A rectangle has a length of 6.3 in and a width of 4.9 in. Find the perimeter of the rectangle.

25. [8.1] Graph the following ordered pairs: $(1,3), (0,4), (-4,-4),$ and $(3,1)$

26. [6.6] A home builder obtained a preconstruction loan of $590,000 for 4 months at an annual interest rate of 9.6%. What is the simple interest due on the loan?

27. [3.1] Find the LCM of the numbers 2, 4, and 13.

28. [3.1] Find the GCF of the numbers 8 and 15.

29. [3.2] Place the correct symbol, $<$ or $>$, between the two numbers: $\dfrac{4}{7}$? $\dfrac{5}{6}$

30. [3.4] Multiply: $\left(-\dfrac{4}{5}\right) \cdot \dfrac{2}{3} \cdot \left(-\dfrac{6}{7}\right)$

31. [3.4] Find the product of $-4\dfrac{2}{5}$ and $2\dfrac{1}{3}$.

32. [3.4] Divide: $\left(-\dfrac{4}{7}\right) \div \left(-\dfrac{9}{14}\right)$

33. [3.6] Add: $\dfrac{5}{8} + \left(-\dfrac{8}{9}\right)$

34. [3.5] Find $1\dfrac{5}{12}$ plus $4\dfrac{5}{8}$.

35. [3.6] Subtract: $-\dfrac{2}{9}-\left(-\dfrac{1}{12}\right)$

36. [3.5] Evaluate the variable expression $x - y$ for the given values of x and y.
$x = 5\dfrac{5}{8}, \ y = 2\dfrac{4}{7}$

37. [3.7] Evaluate: $2\left(\dfrac{5}{9}\right)^2 \cdot \left(-\dfrac{3}{5}\right)^3$

38. [4.1] Write the number 4.820456 to the nearest ten-thousandth.

39. [4.2] Evaluate the variable expression $x + y$ for $x = 62.56$ and $y = -47.18$.

40. [4.4] Convert the decimal 1.44 to a fraction.

41. [4.2] Evaluate the variable expression $\dfrac{x}{y}$ for $x = -0.403$ and $y = 0.31$.

42. [4.6] Simplify: $\sqrt{10+26}$

43. [4.3] Divide and round to the nearest hundredth: $6.466 \div 4.7$

44. [4.3] Multiply: $1.76(-0.003)$

45. [6.1] Solve: $-8x = 27$

Answer Key

1. $x = 3$

2. $x = -\dfrac{3}{5}$

3. $12x + 14y$

4. $-34n + 12$

5. $\dfrac{4}{3}$

6. 0.458

7. 7%

8. 9.375

9. 15%

10. 0.675

11. $64\dfrac{2}{7}\%$

12. $22°$ colder

13. 5

14. 4

15. 23

16. 13

17. 80.6

18. 15.82 million or $15,820,000$

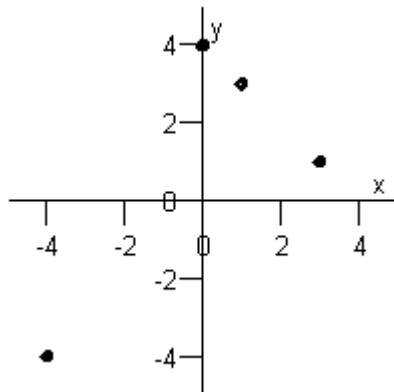19. 34.5%

20. $\$240.95$

21. $\$143.75$

22. $10x^7 y^5$

23. $2v + 8$

24. 22.4 inches

25.

26. $\$18,880.00$

27. 52

28. 1

29. $<$

30. $\dfrac{16}{35}$

31. $-10\dfrac{4}{15}$

32. $\dfrac{8}{9}$

33. $-\dfrac{19}{72}$

34. $6\dfrac{1}{24}$

35. $-\dfrac{5}{36}$

36. $3\dfrac{3}{56}$

37. $-\dfrac{2}{15}$

38. 4.8205

39. 15.38

40. $1\dfrac{11}{25}$

41. -1.3

42. 6

43. 1.38

44. -0.00528

45. $-\dfrac{27}{8}$

1. [2.1] Determine which of the numbers in the set below are integers.

$$\left\{-14, 22, \frac{4}{11}, 9.25, -5.5\right\}$$

2. [2.1] Place the correct inequality symbol, $<$ or $>$, between the numbers -18   -11.

3. [2.1] Evaluate: $-|-12|$

4. [2.2] Find the sum $58 + (-15) + (-16)$.

5. [2.2] Find the difference $-170 - (-31)$.

6. [2.3] Find the product. of –4,–2 and –6 .

7. [2.3] An object moves 490 miles in 7 hours. What is the object's average speed in miles per hour?

8. [2.4] Evaluate the expression $\dfrac{6 + \left[(-24) \div 6\right]}{19}$.

9. [3.6] Divide the fractions $\left(-\dfrac{4}{9}\right) \div \left(-\dfrac{3}{10}\right)$ and write the result in simplest form.

10. [3.6] Evaluate $2 + \dfrac{2}{3} - \dfrac{3}{5}$ and write the result in simplest form.

11. [3.7] Evaluate the expression.

$$-\frac{1}{4}\left(\frac{1}{36}\right) + \left(-\frac{1}{12}\right)^2$$

12. [5.1] Evaluate the algebraic expression $\dfrac{9x - y}{y^2 + 8}$ when $x = 10$ and $y = 6$.

13. [5.2] Simplify the expression $z^3 + 7z^2 + z + z^2 + 6z + 4$.

14. [5.2] Simplify the expression $\left(-\dfrac{5x^2}{4}\right)\left(\dfrac{7}{4}\right)$.

15. [5.2] Simplify the expression $3[7 - (t - 3) + 2(t + 2)]$

16. [5.3] Translate "Fourteen times the difference of a number x and 8" into a variable expression.

17. [5.3] Translate "Six times the sum of x and 5 divided by 2" into a variable expression and simplify.

18. [6.1] Solve the equation $y + \dfrac{4}{7} = \dfrac{5}{8}$.

19. [6.2] Solve the proportion $\dfrac{x}{5} = \dfrac{18}{25}$ to determine x.

20. [6.2] Suppose a car uses 60 gallons of gasoline for a trip of 600 miles. How many gallons would be used on a trip of 100 miles?

21. [7.1] Solve the linear equation $\dfrac{1}{5}x + 4 = \dfrac{8}{9}x - 7$.

22. [7.1] Solve the linear equation $-7(x + 2) = -3(x - 5)$.

23. [7.2] Two buses start at the same point and travel in the same direction at average speeds of 60 miles per hour and 40 miles per hour. After how much time (in hours) the two buses are 60 miles apart?

24. [20.2] A large rectangular-shaped swimming pool has a perimeter of 1,020 meters, and its length is 20 meters more than 6 times its width. Find its dimensions.

25. [8.1] Determine all possible quadrants in which the point (x,y), $xy < 0$ can be located. Assume $x \neq 0$ and $y \neq 0$.

26. [8.3] Find the x- and y-intercepts of the graph of the equation $2x + y = -8$.

27. [8.4] Find the slope (if possible) of the line passing through the points $\left(-\dfrac{3}{7}, -\dfrac{8}{3}\right)$ and $\left(-\dfrac{5}{2}, -2\right)$.

28. [8.4] Sketch the graph of the line through the point $(1, 2)$ with slope $m = 4$.

29. [8.4] Sketch the graph of the line $3x - 2y + 6 = 0$.

30. [8.5] Write an equation of the line that passes through the points $(-5, -1)$ and $(-4, 3)$. Write the equation in slope-intercept form.

31. [10.1] Find the difference $-\left(-6x^2 - 9x + 19\right) - \left(-9x - 6x^2 + 19\right)$.

32. [10.2] Multiply: $3y\left(8yx^8\right)(y^3x)^8$

33. [10.3] Multiply $(3x + 7)\left(x^2 + 8x - 2\right)$ and simplify.

34. [10.3] find the product $(x + 1)(x - 1)$.

35. [10.4] Simplify the expression $\left(2x^{-8}y^7\right)^{-4}\left(2x^{-8}y^7\right)^4$.

36. [10.4] Simplify the expression $\dfrac{12\left(uv^2\right)^4}{(3u)^4 v^4}$..

37. [10.4] Write $167,000$ in scientific notation.

38. [10.5] Divide $\dfrac{12x^4 - 3x^3 + 15x^2 - 7x}{-3x^2}$.

39. [10.5] Divide $\dfrac{x^2 + 3x - 70}{x - 7}$.

40. [11.1] Factor the polynomial $2xy + 4x^2y - 12x^5y^4$.

41. [11.2] Factor the trinomial $x^2 - 7x + 10$

42. [11.2] Factor the trinomial $x^2 + 5xy + 6y^2$

43. [11.2] Factor the polynomial $z^4 + z^3 - 42z^2$ completely.

44. [11.2] Factor the given polynomial $3z^2 + 27z + 42$ completely.

45. [11.3 Factor the trinomial $7x^2 + 25x + 12$.

46. [11.3] Factor the trinomial, $7y^2 - 6y - 1$

47. [11.3] Factor the trinomial, $3x^2 + 16x + 16$

48. [11.3] Factor the polynomial $12z^2 - 129z + 189$ completely.

49. [11.4] Factor the polynomial $81 - 49t^2$.

50. [11.4] Factor the polynomial $z^4 - 256$ completely.

51. [11.4] Factor the trinomial $z^2 - 18z + 81$.

52. [11.4] Factor the trinomial $4x^2 - 36xy + 81y^2$.

53. [11.5] Solve the equation $(y - 9)(y - 4) = 0$.

54. [11.5] Solve the equation $4w^2 = -28w$.

55. [11.5] Solve the equation $4t^2 + 4t = -24t - 24$.

56. [11.5] Solve the equation $(z - 5)(z - 4) = 20$.

57. [11.5] The length of a rectangular garden is four feet less than three times its width. The area of the garden is 15 square feet. Find the width of the garden.

58. [12.1] Simplify the rational expression $\dfrac{y^2 - 25}{7y + 35}$.

59. [12.1] Simplify the rational expression $\dfrac{s^3 + 6s^2 - 9s - 54}{s + 6}$

60. [12.1] Simplify the rational expression $\dfrac{b^2 - 4b - 45}{b^2 - 11b + 18}$.

61. [12.1] Multiply and simplify the rational expression $\dfrac{x^2 + 8x + 7}{x^2 - 2x + 1} \cdot \dfrac{x - 1}{x^2 - 49}$.

62. [12.1] Divide and simplify the expression $\dfrac{x^2 + 6x + 9}{x^2 + x - 30} \div \dfrac{x^2 + 9x + 18}{x^2 - 10x + 25}$.

63. [12.2] Add and simplify the expression $\dfrac{1}{c + 7} + \dfrac{6}{c^2 + 8c + 7}$.

64. [12.2] Subtract and simplify the expression $\dfrac{7}{y^2 - 49} - \dfrac{6}{y^2 - 2y - 35}$.

65. [12.4] Solve the rational equation

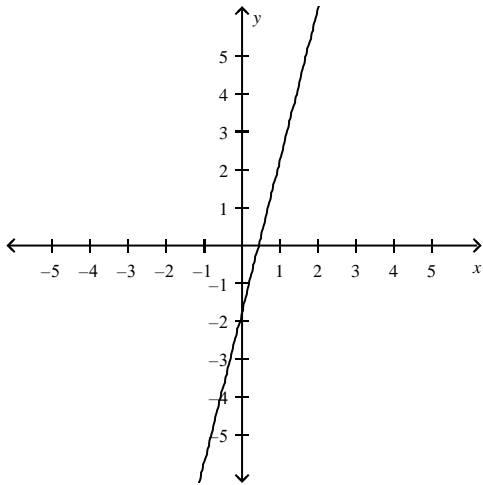$$\frac{7}{t^2 - 2t - 15} - \frac{4}{t - 5} = \frac{3}{t + 3}$$

66. [12.4] Solve the rational equation.
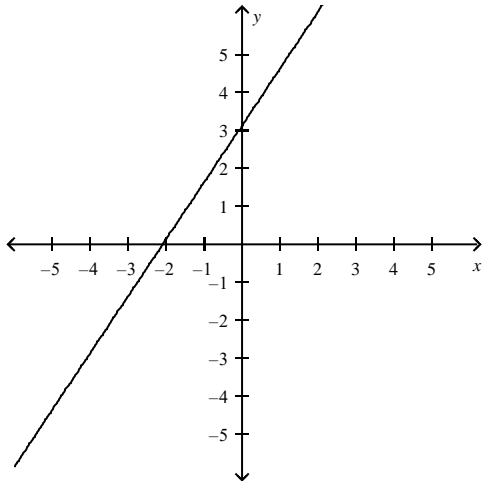
$$x + \frac{1}{x} = \frac{65}{8}$$

1. $\{-14, 22\}$
2. $<$
3. -12
4. 27
5. -139
6. -48
7. 70 mph
8. $\dfrac{2}{19}$
9. $\dfrac{40}{27}$
10. $\dfrac{31}{15}$
11. 0
12. $\dfrac{21}{11}$
13. $z^3 + 8z^2 + 7z + 4$
14. $-\dfrac{35}{16}x^2$
15. $3t + 42$
16. $14(x - 8)$
17. $\dfrac{6(x + 5)}{2} = 3x + 15$
18. $\dfrac{3}{56}$
19. $x = \dfrac{18}{5}$
20. 10 gallons
21. $x = \dfrac{495}{31}$
22. $x = -\dfrac{29}{4}$
23. 3.00 hours
24. Width $= 70$ meters, length $= 440$ meters
25. Quadrant II and IV
26. x-intercept: $(-4, 0)$

    y-intercept: $(0, -8)$
27. $-\dfrac{28}{87}$

28.

29.

30. $y = 4x + 19$

31. $12x^2 + 18x - 38$

32. $24y^{26}x^{16}$

33. $3x^3 + 31x^2 + 50x - 14$

34. $x^2 - 1$

35. 1

36. $\dfrac{4v^4}{27}$

37. 1.67×10^5

38. $-4x^2 + x - 5 + \dfrac{7}{3x}$

39. $x + 10$

40. $2xy\left(1 + 2x - 6x^4y^3\right)$

41. $(x - 5)(x - 2)$

42. $(x + 3y)(x + 2y)$

43. $z^2(z+7)(z-6)$

44. $3(z+7)(z+2)$

45. $(7x+4)(x+3)$

46. $(7y+1)(y-1)$

47. $(3x+4)(x+4)$

48. $3(z-9)(4z-7)$

49. $(9-7t)(9+7t)$

50. $\left(z^2+16\right)(z+4)(z-4)$

51. $(z-9)^2$

52. $\left(2x-9y\right)^2$

53. $y = 9, 4$

54. $w = -7, 0$

55. $t = -6, -1$

56. $z = 0, 9$

57. width $= 3$ feet

58. $\dfrac{y-5}{7}, y \neq -5$

59. $s^2 - 9, s \neq -6$

60. $\dfrac{b+5}{b-2}, b \neq 9$

61. $\dfrac{x+1}{(x-1)(x-7)}, x \neq -7, x \neq 1$

62. $\dfrac{(x+3)(x-5)}{(x+6)^2}, x \neq -3, x \neq 5$

63. $\dfrac{1}{c+1}$

64. $\dfrac{1}{(y+5)(y+7)}$

65. $t = \dfrac{10}{7}$

66. $x = \dfrac{1}{8}$ and $x = 8$