

MATH 095 FINAL EXAM REVIEW  
SOLUTIONS

$$1 \quad 4^3 = 4 \cdot 4 \cdot 4 = \boxed{64}$$

$$2 \quad 38 - 3 \cdot 4 + 8 = 38 - 12 + 8 = 26 + 8 = \boxed{34}$$

$$3 \quad 6[1 + (6^2)] = 6[1 + 36] = 6 \cdot 37 = \boxed{222}$$

$$4 \quad 13 + [-5 + (-8)] = 13 + [-13] = \boxed{0}$$

$$5 \quad 2 + [3 + (-7) + (-2)] = 2 + 3 - 7 - 2 = 5 - 9 = \boxed{-4}$$

$$6 \quad 8 - (-2) = 8 + 2 = \boxed{10}$$

$$7 \quad -2 - (-6) = -2 + 6 = \boxed{4}$$

$$8 \quad -9 - (7 - 11) = -9 - (-4) = -9 + 4 = \boxed{0}$$

$$9 \quad (-8)(9) = \boxed{-72}$$

$$10 \quad \frac{-10(-2)}{7 - (-3)} = \frac{+20}{+10} = \boxed{2}$$

$$11 \quad 4(4) - 2(1) + 5(-3) = 16 - 2 - 15 = 16 - 17 = \boxed{-1}$$

$$12 \quad -5(-1)^2 + 2(5) = -5 \cdot 1 + 10 = -5 + 10 = \boxed{+5}$$

$$13 \quad 2t + 4 - 3 = \boxed{2t + 1}$$

$$14 \quad -3 - (4 - 5P) = -3 - 4 + 5P = \boxed{5P - 7}$$

$$15 \quad 3y^2 - 4y^3 - 7y^2 + 6y^3 = (6 - 4)y^3 + (3 - 7)y^2 = \boxed{2y^3 - 4y^2}$$

$$16 \quad -3(4y - 5) + (3y + 8) = -12y + 15 + 3y + 8 = \boxed{-9y + 23}$$

$$17 \quad \begin{array}{r} 5x - 3 = 12x + 11 \\ -5x - 11 \quad -5x - 11 \\ \hline -14 = 7x \\ \frac{-14}{7} = \frac{7x}{7} \end{array}$$

$$\boxed{x = -2}$$

$$18 \quad \begin{array}{r} 6 - 2x = 5x - 9x + 16 \\ -16 + 2x \quad \quad \quad +2x - 16 \\ \hline -10 = -2x \end{array}$$

$$\frac{-10}{-2} = \frac{-2x}{-2}$$

$$\boxed{x = 5}$$

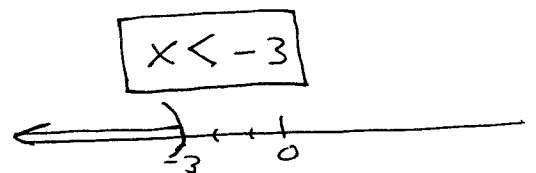
$$19 \quad \begin{array}{r} 3(x + 4) = 5(x - 2) \\ 3x + 12 = 5x - 10 \\ -3x + 10 \quad -3x + 10 \\ \hline 22 = 2x \end{array}$$

$$\frac{2x}{2} = \frac{22}{2}$$

$$\boxed{x = 11}$$

$$20 \quad \begin{array}{r} 7x + 3 < 3x - 9 \\ -3x - 3 \quad -3x - 3 \\ \hline 4x < -12 \end{array}$$

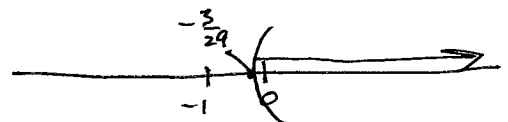
$$\frac{4x}{4} < \frac{-12}{4}$$



$$21 \quad \begin{array}{r} 5(5 - 4x) + 7x < 4(7 + 4x) \\ 25 - 20x + 7x < 28 + 16x \\ 25 - 13x < 28 + 16x \\ -28 + 13x \quad -28 + 13x \\ \hline -3 < 29x \end{array}$$

$$\frac{-3}{29} < \frac{29x}{29}$$

$$\boxed{x > -\frac{3}{29}}$$



$$22 \quad 9t^3(t-t^2+9t^3) = \boxed{9t^4 - 9t^5 + 81t^6}$$

$$23 \quad (6x+7)(5x+4) = 30x^2 + 24x + 35x + 28 = \boxed{30x^2 + 59x + 28}$$

$$24 \quad (5t-6)(5t+6) = \boxed{25t^2 - 36}$$

$$25 \quad (2R+3P)(2R-3P) = \boxed{4R^2 - 9P^2}$$

$$26 \quad 20x^2 + 5x = \boxed{5x(4x+1)}$$

$$27 \quad 12t^2 + 4t = \boxed{4t(3t+1)}$$

$$28 \quad v^2 + 13v + 30 = \boxed{(v+10)(v+3)}$$

$$29 \quad R^2 + 3R - 28 = \boxed{(R+7)(R-4)}$$

$$30 \quad w^2 - 12w + 35 = \boxed{(w-7)(w-5)}$$

$$31 \quad w^2 - w - 20 = \boxed{(w+4)(w-5)}$$

$$32 \quad 4A^2 + 9A - 28 \quad \text{PRODUCT OF (4)(-28)} = -112$$

$$\text{SUM} = +9 \quad +16; -7$$

$$4A^2 + 16A - 7A - 28 = 4A(A+4) - 7(A+4) = \boxed{(4A-7)(A+4)}$$

$$33 \quad 30y^2 - 11y - 30 \quad \text{PRODUCT OF (30)(-30)} = -900$$

$$\text{SUM} = -11 \quad -36; +25$$

$$30y^2 + 25y - 36y - 30 = 5y(6y+5) - 6(6y+5) = \boxed{(5y-6)(6y+5)}$$

34  $15t^2 + 21t - 18$     PRODUCT OF  $(15)(-18) = -270$     SUM = 21    30, -9  
 $15t^2 + 30t - 9t - 18 = 15t(t+2) - 9(t+2) = \boxed{(15t-9)(t+2)}$   
 $\boxed{3(5t-3)(t+2)}$

35  $B^2 - 49 = \boxed{(B+7)(B-7)}$

36  $9c^2 - 25 = \boxed{(3c+5)(3c-5)}$

37  $T^2 - 8T + 12 = 0$     IF  $T-6=0$      $T=6$   
 $(T-6)(T-2) = 0$     IF  $T-2=0$      $T=2$      $\boxed{T=2, 6}$

38  $A^2 = 32 - 4A$      $A^2 + 4A - 32 = 0$      $(A+8)(A-4) = 0$   
 IF  $A+8=0$      $A=-8$     IF  $A-4=0$      $T=4$      $\boxed{T=-8, 4}$

39  $\frac{8x^5 - 24x^3 + 20x}{4x} = \boxed{2x^4 - 6x^2 + 5}$

40  $\frac{8x^5 - 4x^4 + 10x^2}{-2x^2} = \boxed{-4x^3 + 2x^2 - 5}$

41  $\frac{7x-21}{6x-18} = \frac{7(x-3)}{6(x-3)} = \boxed{\frac{7}{6}}$

42  $\frac{2k^2-2k}{7k-7} = \frac{2k(k-1)}{7(k-1)} = \boxed{\frac{2k}{7}}$

43  $\frac{5y^5}{11v^5} \cdot \frac{121v^7}{25y} = \boxed{\frac{11}{5} v^2 y^4}$

$$44 \quad \frac{7v-49}{22} \div \frac{v-7}{6} = \frac{7(v-7)}{\cancel{22}^1} \cdot \frac{6^3}{(v-7)} = \boxed{\frac{21}{11}}$$

$$45 \quad \frac{7x-7}{5x+5} \cdot \frac{14x+14}{10x-10} = \frac{7(x-1)}{5(x+1)} \cdot \frac{\cancel{14}^7(x+1)}{\cancel{10}^5(x-1)} = \boxed{\frac{49}{25}}$$

$$46 \quad \frac{z^2-6z-16}{z^2-4z+4} \cdot \frac{z-2}{z-8} = \frac{(z+2)(z-8)(z-2)}{(z-2)(z-2)(z-8)} = \boxed{\frac{z+2}{z-2}}$$

$$47 \quad \frac{5+5k}{4} + \frac{1+k}{8} = \frac{5}{4}(1+k) + \frac{1}{8}(1+k) = \frac{10}{8}(1+k) + \frac{1}{8}(1+k) \\ = \boxed{\frac{11}{8}(1+k)}$$

$$48 \quad \frac{9}{x+2} + \frac{2}{3x} = \frac{9}{x+2} \cdot \frac{3x}{3x} + \frac{2}{3x} \cdot \frac{x+2}{x+2} = \frac{27x+2(x+2)}{3x(x+2)} \\ = \boxed{\frac{29x+4}{3x(x+2)}}$$

$$49 \quad \frac{u}{u-3} + \frac{8}{u+3} = \frac{u}{(u-3)} \cdot \frac{(u+3)}{(u+3)} + \frac{8}{(u+3)} \cdot \frac{(u-3)}{(u-3)} = \frac{u^2+3u+8u-24}{(u+3)(u-3)} \\ = \boxed{\frac{u^2+11u-24}{(u+3)(u-3)}}$$

$$50 \quad \frac{17y}{3} - \frac{5y}{2} = -19 \quad \text{MULT. BOTH SIDES BY } 3 \cdot 2 = 6$$

$$34y - 15y = -114$$

$$\frac{19y}{19} = \frac{-114}{19}$$

$$\boxed{y = -6}$$

$$51 \quad \frac{x+5}{9} = \frac{x-3}{8}$$

$$8(x+5) = 9(x-3)$$

$$8x + 40 = 9x - 27$$

$$40 = x - 27$$

$$67 = x$$

$$\boxed{x = 67}$$

$$52 \quad 6x + 5y = 30$$

x	y
0	6
5	0
10	-6

$$6(0) + 5y = 30 \quad 5y = 30 \quad y = 6$$

$$6x + 5(0) = 30 \quad 6x = 30 \quad x = 5$$

$$6(10) + 5y = 30 \quad 5y = 30 - 60 \quad 5y = -30$$

$$53 \quad y = -x - 4$$

x	y
-5	1
-2	-2

$$y = -(-5) - 4 = 5 - 4 = 1$$

$$y = -(-2) - 4 = 2 - 4 = -2$$

$$54 \quad y = \frac{x}{3} - 1$$

x	y
3	0
0	-1

$$y = \frac{3}{3} - 1 = 1 - 1 = 0$$

$$y = \frac{0}{3} - 1 = 0 - 1 = -1$$

$$55 \quad 7x - 3y = 63$$

Y-INT = (0, -21)
X-INT = (9, 0)

x	y
0	-21
9	0

$$7(0) - 3y = 63 \quad -3y = 63 \quad y = -21$$

$$7x - 3(0) = 63 \quad 7x = 63 \quad x = 9$$

$$56 \quad x + 7y = 0$$

x	y
0	0
0	0

Both x- & y-INT. ARE (0,0)

$$57 \quad \begin{array}{l} (-9, -12) \#1 \\ (-18, -13) \#2 \end{array}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-13 - (-12)}{-18 - (-9)}$$

$$= \frac{-13 + 12}{-18 + 9} = \frac{-1}{-9} = \boxed{\frac{1}{9}}$$

$$58 \quad \begin{array}{l} (6, 4) \#1 \\ (7, -6) \#2 \end{array}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6 - 4}{7 - 6} = \frac{-10}{1} = \boxed{-10}$$

$$59 \quad y = -5x + 6$$

$$\boxed{-5}$$

$$60 \quad 3y = x + 3$$

$$y = \frac{1}{3}x + 1$$

$$\boxed{\frac{1}{3}}$$

$$61 \quad -\sqrt{\frac{16}{9}} = \boxed{-\frac{4}{3}}$$

62 NO REAL SOLUTION

$$63 \quad \sqrt{5} \approx \boxed{2.236067977}$$

64  $\sqrt{7}$  IS IRRATIONAL

$$65 \quad \sqrt[3]{27} = \boxed{3}$$

$$66 \quad \sqrt[3]{-27} = \boxed{-3}$$

$$67 \quad \sqrt{45} = \sqrt{9} \sqrt{5} = \boxed{3\sqrt{5}}$$

$$68 \quad \sqrt{20} = \sqrt{4} \sqrt{5} = \boxed{2\sqrt{5}}$$

$$69 \quad \sqrt{64x^8y^{18}} = \sqrt{(8x^4y^9)^2} = \boxed{8x^4y^9}$$

$$70 \quad \sqrt{\frac{x^8}{y^6}} = \sqrt{\left(\frac{x^4}{y^3}\right)^2} = \boxed{\frac{x^4}{y^3}}$$

$$71 \quad 5\sqrt{3} - 3\sqrt{3} = \boxed{2\sqrt{3}}$$

$$\begin{aligned} 72 \quad 3\sqrt{20} + \sqrt{45} - \sqrt{125} &= 3\sqrt{4}\sqrt{5} + \sqrt{9}\sqrt{5} - \sqrt{25}\sqrt{5} \\ &= 3 \cdot 2\sqrt{5} + 3\sqrt{5} - 5\sqrt{5} \\ &= (6+3-5)\sqrt{5} = \boxed{4\sqrt{5}} \end{aligned}$$

$$\begin{aligned} 73 \quad (2\sqrt{7} - 4\sqrt{5})(5\sqrt{7} + 10\sqrt{5}) &= \\ &= 2 \cdot 5 \cdot \sqrt{7} \cdot \sqrt{7} + 2 \cdot 10 \cdot \sqrt{5} \cdot \sqrt{7} - 4 \cdot 5 \cdot \sqrt{5} \cdot \sqrt{7} - 4 \cdot 10 \cdot \sqrt{5} \cdot \sqrt{5} \\ &= 10 \cdot 7 + 20\sqrt{35} - 20\sqrt{35} - 40 \cdot 5 = 70 - 200 = \boxed{-130} \end{aligned}$$

$$\begin{aligned} 74 \quad (\sqrt{6} - \sqrt{3})(\sqrt{6} + \sqrt{3}) &= \\ &= \sqrt{6} \cdot \sqrt{6} + \sqrt{6} \cdot \sqrt{3} - \sqrt{6} \cdot \sqrt{3} - \sqrt{3} \cdot \sqrt{3} \\ &= 6 - 3 = \boxed{3} \end{aligned}$$

$$75 \quad \frac{\sqrt{490}}{\sqrt{10}} = \sqrt{\frac{490}{10}} = \sqrt{49} = \boxed{7}$$

$$76. \frac{6\sqrt{33}}{3\sqrt{11}} = \frac{6}{3} \sqrt{\frac{33}{11}} = \boxed{2\sqrt{3}}$$

$$77. \frac{12 + 4\sqrt{3}}{4} = \frac{4(3 + \sqrt{3})}{4} = \boxed{3 + \sqrt{3}}$$

$$78. \frac{15 + \sqrt{18}}{3} = \frac{15 + \sqrt{9}\sqrt{2}}{3} = \frac{15 + 3\sqrt{2}}{3} = \frac{3(5 + \sqrt{2})}{3} = \boxed{5 + \sqrt{2}}$$