MAT 1175 FINAL EXAM REVIEW (Part: Algebra Review)

#1 Multiply or divide and simplify completely:

a) $\dfrac{x^2 - 7x - 60}{x^2 - 25} \cdot \dfrac{x^2 + 5x + 6}{x^2 - 10x - 24}$

b) $\dfrac{x^2 - 9}{x^2 + 6x - 7} \div \dfrac{x^2 - x - 6}{3x + 21}$

c) $\dfrac{2x^2 - x - 6}{4x^2 - 9} \cdot \dfrac{6x^2 - 7x - 3}{3x^2 + 13x + 4}$

#2 Divide by long division: a) $\dfrac{3y^2 - 4y + 1}{y - 2}$

b) $\dfrac{2x^2 + 5x - 7}{x + 3}$

c) $\dfrac{6x^2 - 13x - 8}{2x + 1}$

#3 a) Combine: $\dfrac{7}{x - 5} + \dfrac{4}{x + 2}$

b) Combine: $\dfrac{3}{x - 3} - \dfrac{9 - x}{x^2 - 4x + 3}$

#4 a) Solve for y: $\dfrac{y + 2}{4y} - \dfrac{1}{2} = \dfrac{y - 9}{10y}$

b) Solve for x: $\dfrac{x + 3}{x - 2} - \dfrac{2}{x} = \dfrac{9x - 8}{x^2 - 2x}$

#5 Simplify and combine:

a) $3\sqrt{27} - 2\sqrt{12} + \sqrt{75} - \sqrt{3}$

b) $4x\sqrt{18x^3} - 7x^2\sqrt{32x} + \sqrt{162x^5}$

c) $3y\sqrt{45x^3y^2} + 2x\sqrt{80xy^4}$

#6 Multiply and Simplify:

a) $\left(\sqrt{2} - \sqrt{7}\right)^2$

b) $5\sqrt{2}\left(3 - \sqrt{6}\right)$

c) $\left(\sqrt{3} - 2\sqrt{5}\right)\left(4\sqrt{3} + \sqrt{5}\right)$

#7 Rationalize the denominator and simplify:

a) $\dfrac{12}{\sqrt{10} + 1}$

b) $\dfrac{10}{\sqrt{11} + \sqrt{5}}$

c) $\dfrac{3\sqrt{2}}{2 - \sqrt{2}}$

d) $\dfrac{8}{3 - \sqrt{5}}$

#8 Solve for x using the <u>quadratic formula</u>. Express your the answers in simplest radical form.

a) $x^2 - 10x + 7 = 0$

b) $3x^2 - 4x = 2$

c) $4x^2 + 4x = 6$

d) $6x^2 + 7x - 10 = 0$

#9 Write the following in Slope Intercept form and sketch the graph:

a) $3x + 2y - 2 = 0$

b) $4x - 3y - 12 = 0$

c) $2x + 5y + 10 = 0$

#10 Simplify each the following and express your answers using only positive exponents:

a) $\dfrac{a^{-3}b^{-3}}{ab^{-5}}$

b) $\dfrac{\left(x^4\right)^{-2}}{x^{-2}x^{-3}}$

c) $\dfrac{x^{-2}y}{\left(x^{-3}y^4\right)^{-1}}$

#11 Solve and check:

a) $\sqrt{x + 1} + 5 = x$

b) $\sqrt{x - 1} = x - 3$

c) $\sqrt{4 - 7x} = 2 - x$

#12 Find the equation of the line that is <u>perpendicular</u> to the given line and goes through the given point.

a) $3y - 2x + 5 = 0$ at (4, 1)

b) $5x + 2y + 1 = 0$ at (5, -1)

#13 Find the equation of the line that is <u>parallel</u> to the given line and goes through the given point.

a) $3y - 2x + 5 = 0$ at (-6, -5)

b) $5x + 2y + 1 = 0$ at (-2, 7)

#1. **a)** $\dfrac{x+3}{x-5}$ **b)** $\dfrac{x+3}{(x-1)(x+2)}$ **c)** $\dfrac{x-2}{x+4}$

#2. **a)** $3y+2+\dfrac{5}{y-2}$ **b)** $2x-1-\dfrac{4}{x+3}$ **c)** $3x-8$

#3 **a)** $\dfrac{11x-6}{(x-5)(x+2)}$ **a)** $\dfrac{4}{x-1}$

#4 **a)** $y=4$ **b)** $x=6$

#5 **a)** $9\sqrt{3}$ **b)** $-7x^2\sqrt{2x}$ **c)** $17xy^2\sqrt{5x}$

#6 **a)** $9-2\sqrt{14}$ **b)** $15\sqrt{2}-10\sqrt{3}$ **c)** $2-7\sqrt{15}$

#7 **a)** $\dfrac{4\sqrt{10}-4}{3}$ **b)** $\dfrac{5\sqrt{11}-5\sqrt{5}}{3}$ **c)** $3\sqrt{2}+3$ **d)** $6+2\sqrt{5}$

#8 **a)** $x=5\pm3\sqrt{2}$ **b)** $x=\dfrac{2\pm\sqrt{10}}{3}$ **c)** $x=\dfrac{-1\pm\sqrt{7}}{2}$ **d)** $x=\dfrac{5}{6},\ x=-2$

#9 **a)** $y=-\dfrac{3}{2}x+1$ **b)** $y=\dfrac{4}{3}x-4$ **c)** $y=-\dfrac{2}{5}x-2$

#10 **a)** $\dfrac{b^2}{a^4}$ **b)** $\dfrac{1}{x^3}$ **c)** $\dfrac{y^5}{x^5}$

#11 **a)** $x=8$ **b)** $x=5$ **c)** $x=0,-3$

#12 **a)** $y=-\dfrac{3}{2}x+7$ **b)** $y=\dfrac{2}{5}x-3$

#13 **a)** $y=\dfrac{2}{3}x-1$ **b)** $y=-\dfrac{5}{2}x+2$