NYC College of Technology
Mathematics Department

Revised Spring 2011: C olucci, Kan, Niezgoda , Batyr

FINAL EXAM REVIEW– MAT 1175

#1 a) Divide and simplify: $\frac{x^2-9}{x^2+6x-7} \div \frac{x^2-x-6}{3x+21}$ b) Multiply and simplify: $\frac{x^2-7x-60}{x^2-25} \cdot \frac{x^2-10x-24}{x^2+5x+6}$

c) Divide and simplify: $\frac{2x^2+3x-14}{x+1} \div \frac{x-2}{x^2-2x-3}$ d) Multiply and simplify: $\frac{x^2-2x}{x^2-4} \cdot \frac{3x^2-5x-2}{3x^2+x}$

#2 Divide by long division: a) $\frac{3y^2-4y+1}{y-2}$ b) $\frac{2x^2+5x-7}{x+3}$

#3 a) Combine: $\frac{x+2}{x^2-36} - \frac{x}{x^2+9x+18}$ b) Combine: $\frac{2}{x-3} - \frac{3}{x^2-9}$

#4 a) Solve for y: $\frac{y+2}{4y} - \frac{1}{2} = \frac{y-9}{10y}$ b) Solve for x: $\frac{x+3}{x-2} - \frac{2}{x} = \frac{9x-8}{x^2-2x}$

#5 Simplify and combine: a) $4\sqrt{18} - 7\sqrt{32} + \sqrt{162}$ b) $3\sqrt{27} - \sqrt{12} + 2\sqrt{75}$

#6 Multiply and Simplify:

a) $\left(\sqrt{2} - \sqrt{6}\right)^2$ 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) $\frac{12}{\sqrt{10}+1}$ b) $\frac{8}{\sqrt{11}+\sqrt{5}}$ c) $\frac{3\sqrt{2}}{2-\sqrt{2}}$ d) $\frac{8}{3-\sqrt{5}}$

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

a) $3x + 2y - 2 = 0$ b) $4x - 3y - 12 = 0$ c) $2x + 5y + 10 = 0$

#9 Solve for x using the quadratic formula. Express your the answers in simplest radical form.

a) $x^2 - 10x + 7 = 0$ b) $3x^2 - 4x = 2$ c) $x^2 - 4x = 8$

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

a) $\frac{a^{-3}b^{-3}}{ab^{-5}}$ b) $\frac{\left(x^4\right)^{-2}}{x^{-2}x^{-3}}$ c) $\frac{x^{-2}y}{\left(x^{-3}y^4\right)^{-1}}$

#11 Solve and check:

a) $4\sqrt{x-2} - 2 = -x$ b) $x - 3\sqrt{x-5} = 5$ c) $\sqrt{4-x} = x+2$

#12 Find the equation of the line that is perpendicular to the given line and goes through the given point and graph the line.

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

#13 Find the equation of the line that is parallel to the given line and goes through the given point and graph the line.

a) $3y-2x+5=0$ at (-3, -3) b) $5x+2y+1=0$ at (-2, 7)

#14 Write the linear equation in slope-intercept form and graph the line.

a) $3x+5y-15=0$ b) $2x-3y+6=0$

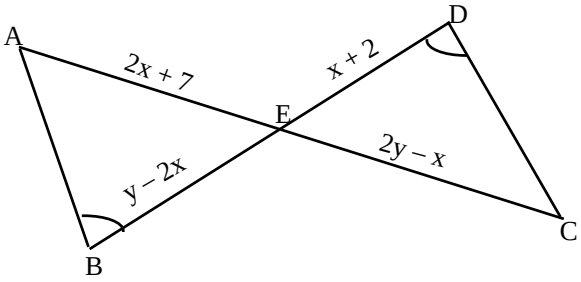
#15 Given $\angle B = \angle D$ and AE = EC.

a) How are the triangles related?

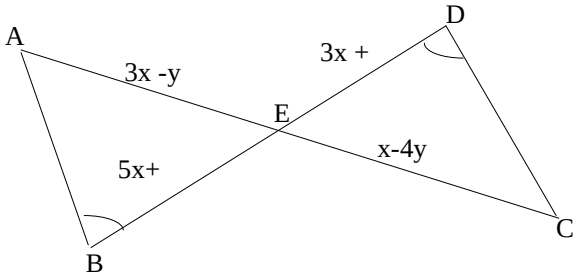
b) Solve for x and y,

c) Find the lengths of AC and BD

(i).



(ii)

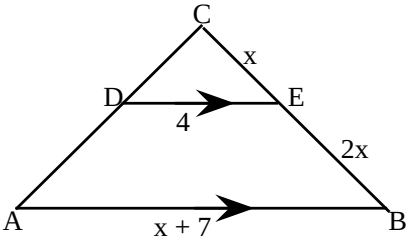


#16 In the figure, DE is parallel to AB.

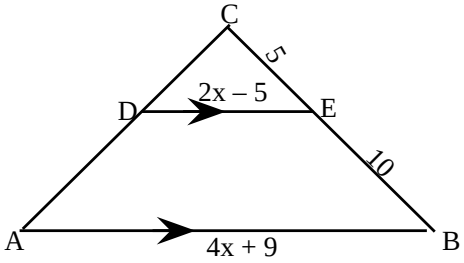
a) How are the triangles related?

b) Solve for x, and find AB

(i)

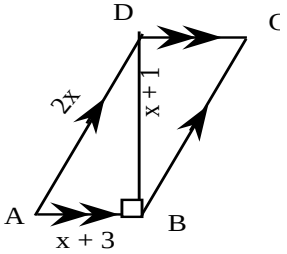


(ii)

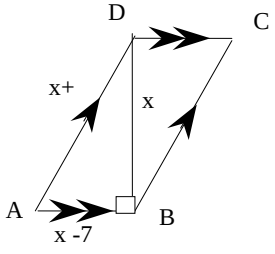


#17. If ABCD is a parallelogram and $\angle DBA$ is 90°, solve for *x*, AB, DB, and AD and find the area of ABCD.

(i)



(ii)

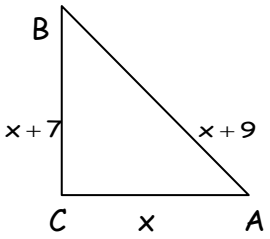


#18 In the right triangle $\triangle ABC$, $\angle C = 90^\circ$, AC = x, BC = x + 7, AB = x + 9.

a) Solve for x,

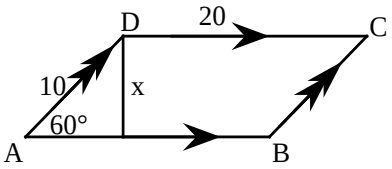
b) Find all three sides of the triangle

c) Find the area of the triangle.



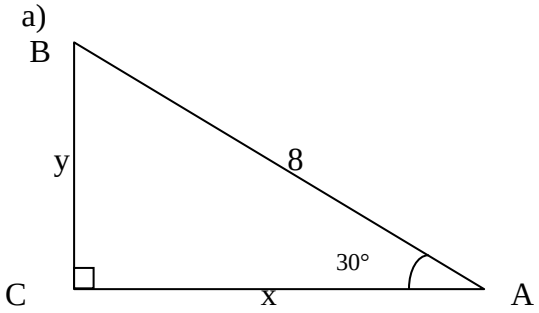
#19 a) Find x (leave the answer in radical form)

b) Find the area of the parallelogram ABCD. (Leave the answer in radical form)

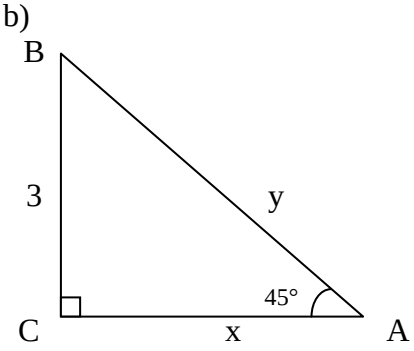


#20 Find x and y.(Leave answer in simplest radical form)

a)



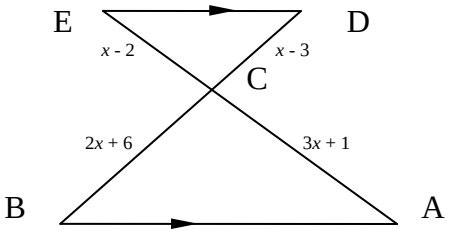
b)



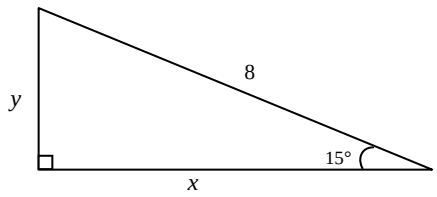
#21 In the figure, DE || AB.

a) How are the triangles related?

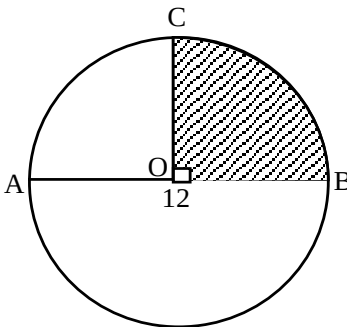
b) Solve for x, and find EA and CB



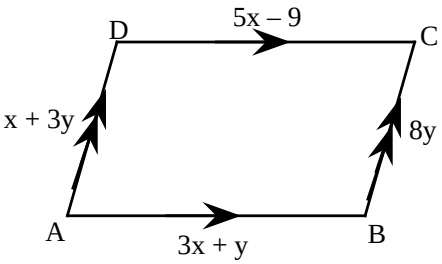
#22. Find x and y to the nearest tenth



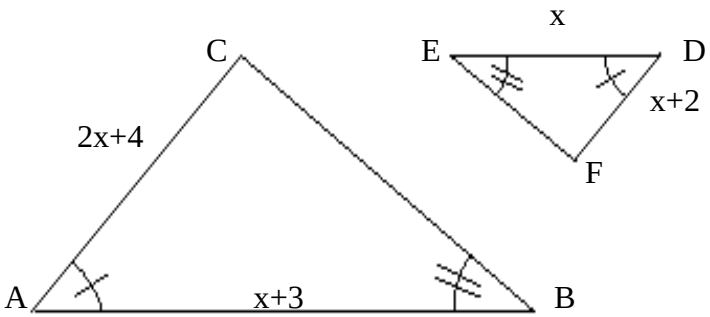
#23 If the diameter AOB = 12 and ∠COB = 90, Find the circumference of the circle, and the area of the shaded sector and round your answers to the nearest tenth.



#24. a) Find *x* and *y*
b) Find AB and BC



#25
In the figure, ∠A = ∠D and ∠B = ∠E. AB = x+3, AC = 2x+4, DE = x and DF = x+2.
(a) How are the triangles related?
(b) Find x.



ANSWERS:

 # 1 **a)** $\frac{3(x+3)}{(x-1)(x+2)}$ **b)** $\frac{(x-12)(x-12)}{(x-5)(x+3)}$ **c)** $(2x+7)(x-3)$ **d)** $\frac{(x-2)}{(x+2)}$

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

#3 **a)** $\frac{11x+6}{(x-6)(x+6)(x+3)}$ **b)** $\frac{2x+3}{(x-3)(x+3)}$

#4 **a)** $y=4$ **b)** $x=6$ (reject x=2)

#5 **a)** $-7\sqrt{2}$ **b)** $17\sqrt{3}$

#6 **a)** $8-4\sqrt{3}$ **b)** $15\sqrt{2}-10\sqrt{3}$ **c)** $22-9\sqrt{15}$

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

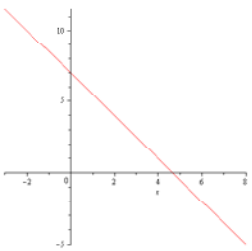
#8 **a)** $y=-\frac{3}{2}x+1$ **b)** $y=\frac{4}{3}x-4$ **c)** $y=-\frac{2}{5}x-2$

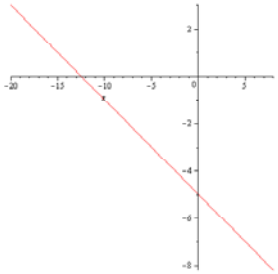
#9 **a)** $x=5\pm3\sqrt{2}$ **b)** $x=\frac{2\pm\sqrt{10}}{3}$ **c)** $x=2\pm2\sqrt{3}$

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

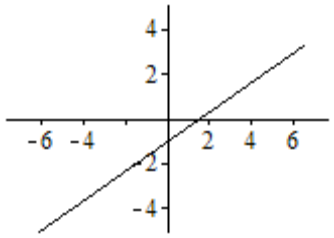
#11 **a)** $x=2$ (reject x=18) **b)** $x=5, x=14$ **c)** x = 0 (reject x = - 5)

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

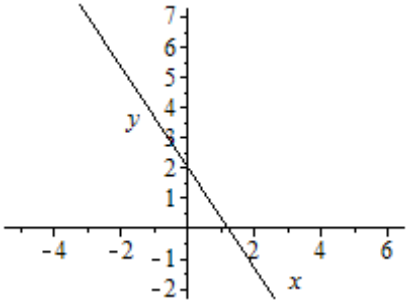




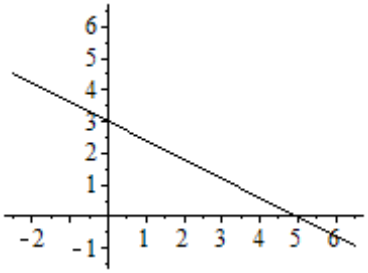
#13 **a)** $y = \frac{2}{3}x - 1$



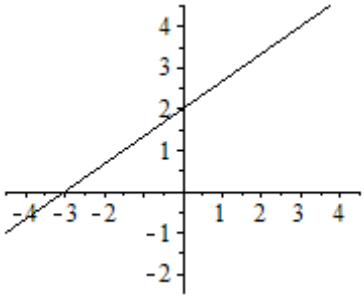
b) $y = -\frac{5}{2}x + 2$



#14. **a)** $y = -\frac{3}{5}x + 3$



b) $y = \frac{2}{3}x + 2$



#15. (i) **a)** congruent triangles (AAS = AAS)
b) $x = 1, y = 5$ **c)** AC = 18, BD = 6

(ii) **a)** congruent triangles (AAS = AAS)
b) $x = 3, y = -2$ **c)** AC = 22, BD = 26

#16. **(i) a)** similar triangles (*AA=AA*)
b) $x = 5$; AB = 12

(ii) **a)** similar triangles (*AA=AA*)
b) $x = 12$; AB = 57

#17. **(i) a)** $x = 5$; AB = 8; DB = 6; AD = 10
b) 48 sq. units

(ii **a)** $x = 12$; AB = 5; DB = 12; AD = 13
b) 60 sq. units

#18. **a)** x = 8; **b)** AC = 8; BC = 15; AB = 17 **c)** 60 sq. units

#19. **a)** $x = 5\sqrt{3}$ **b)** $100\sqrt{3}$ sq. units

#20. **a)** $x = 4\sqrt{3}$ $y = 4$ **b)** $x = 3; y = 3\sqrt{2}$

#21. **a)** similar triangles (*AA=AA*) b) x = 9; EA = 35; CB = 24

#22. $x = 7.7$ $y = 2.1$

#23. $C = 12\pi = 37.7$ $A = 9\pi = 28.3$

#24. **a)** $x = 5$; $y = 1$ **b)** AB = 16; BC = 8

#25. **a)** similar triangles (*AA*) **b)** $x = 3$