

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) $(\sqrt{2} - \sqrt{6})^2$

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

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

#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) $\frac{(x^4)^{-2}}{x^{-2}x^{-3}}$

c) $\frac{x^{-2}y}{(x^{-3}y^4)^{-1}}$

#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 $(-2, 7)$

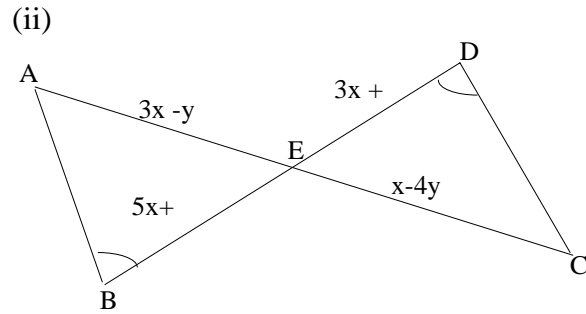
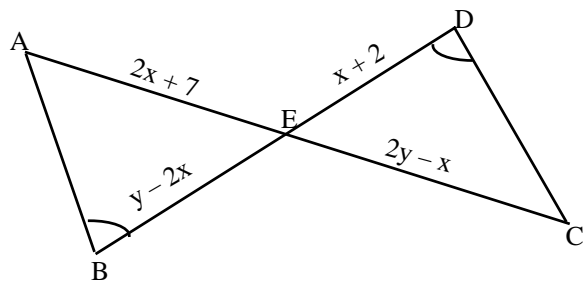
#14 Write the linear equation in slope-intercept form and graph the line.

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

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

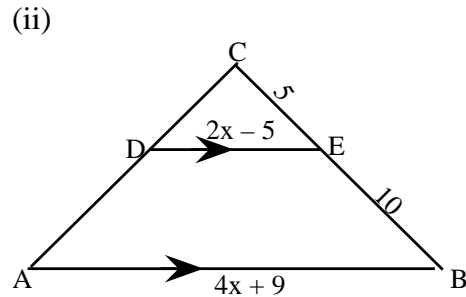
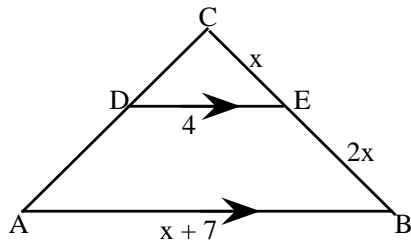
#15 Given $\angle B = \angle D$ and $AE = EC$.

- a) How are the triangles related?
- b) Solve for x and y ,
- c) Find the lengths of AC and BD

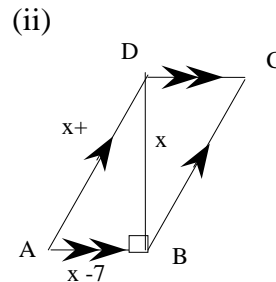
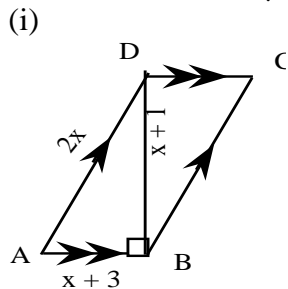


#16 In the figure, DE is parallel to AB .

- a) How are the triangles related?
- b) Solve for x , and find AB



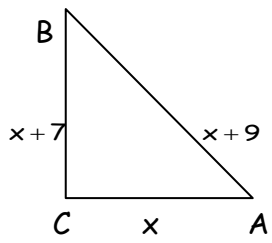
#17. If $ABCD$ is a parallelogram and $\angle DBA$ is 90° , solve for x , AB , DB , and AD and find the area of $ABCD$.



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

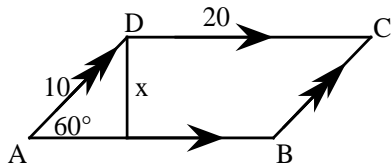
- a) Solve for x ,
- b) Find all three sides of the triangle

c) Find the area of the triangle.

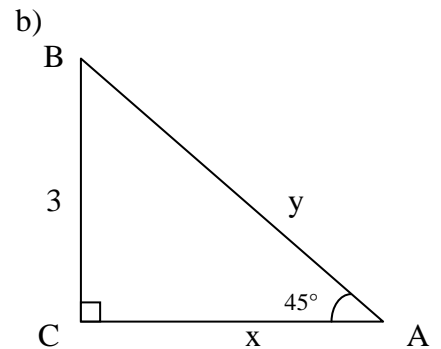
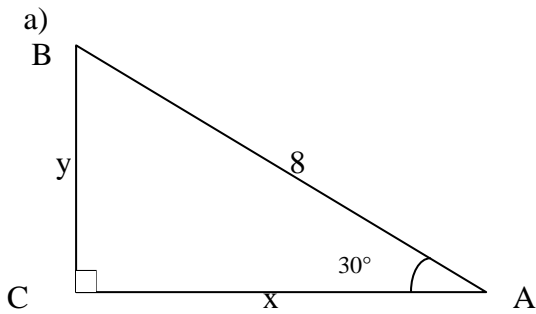


#19 a) Find x (leave the answer in radical form)

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



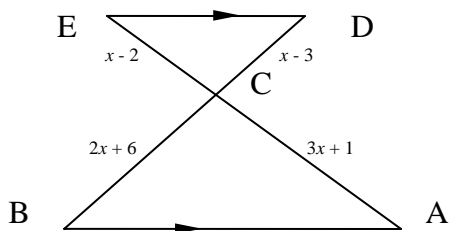
#20 Find x and y . (Leave answer in simplest radical form)



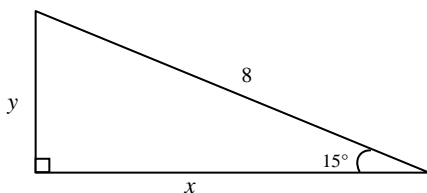
#21 In the figure, $DE \parallel AB$.

a) How are the triangles related?

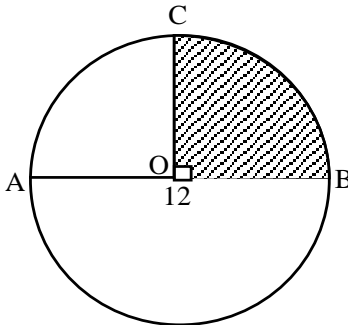
b) Solve for x , and find EA and CB



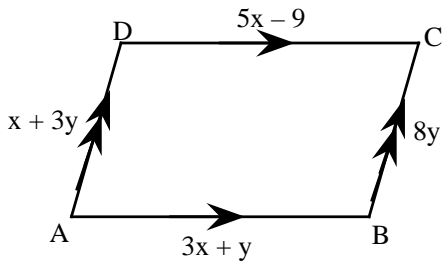
#22. Find x and y to the nearest tenth



#23 If the diameter $AOB = 12$ and $\angle COB = 90^\circ$, 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

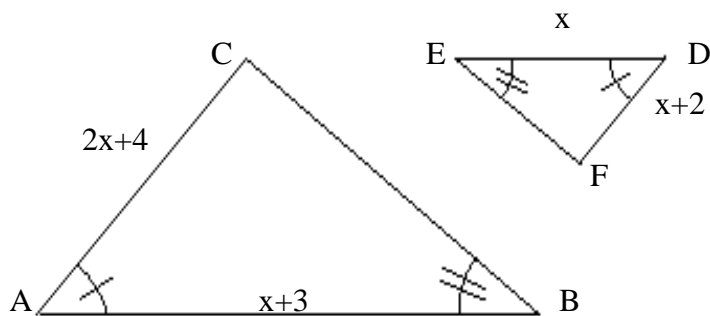


#25

In the figure, $\angle A = \angle D$ and $\angle B = \angle E$. $AB = x+3$, $AC = 2x+4$, $DE = x$ 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) $\frac{-7\sqrt{2}}{\sqrt{3}}$

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) $x = 5 \pm 3\sqrt{2}$

b) $x = \frac{2 \pm \sqrt{10}}{3}$

c) $x = 2 \pm 2\sqrt{3}$

#10 a) $\frac{b^2}{a^4}$

b) $\frac{1}{x^3}$

c) $\frac{y^5}{x^5}$

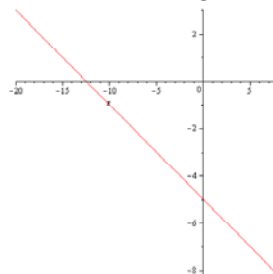
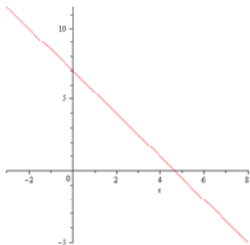
#11 a) $x = 2$ (reject $x=18$)

b) $x=5, x=14$

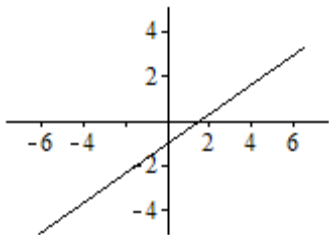
c) $x = 0$ (reject $x = -5$)

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

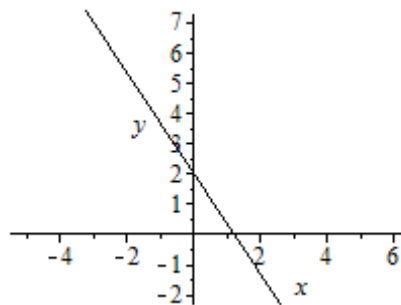
b) $y = \frac{2}{5}x-5$



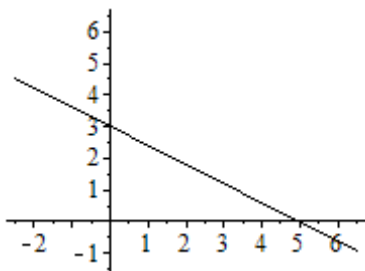
#13 a) $y = \frac{2}{3}x - 1$



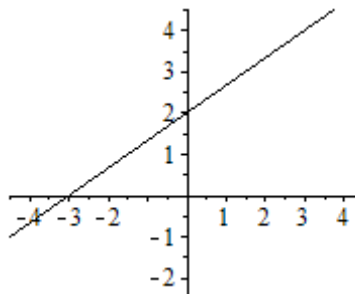
b) $y = -\frac{5}{2}x + 2$



#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)** $x = 3$