MAT 1175 – COURSE REVIEW #1

1. **Simplify:** $\dfrac{2x^2 + 3x - 14}{x - 2}$

2. **Solve** for x: $\dfrac{x+5}{4} - \dfrac{2-3x}{6} = \dfrac{14}{3}$

3. **Solve** for x: $\sqrt{x+1} + 5 = x$

4. **Combine** in each example below:

   a) $2\sqrt{72} - 5\sqrt{8}$

   b) $\dfrac{3x}{4y} - \dfrac{5}{6y^2}$

5. **Rationalize the denominators** in each example below:

   a) $\dfrac{8}{5\sqrt{3}}$
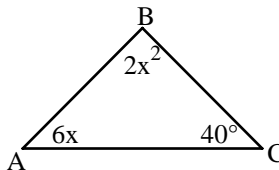
   b) $\dfrac{3}{\sqrt{3} - \sqrt{2}}$

6. **Solve graphically:**
   $$x + y = 7$$
   $$2x - y = 5$$

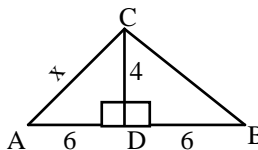7. **Solve** using the **quadratic formula**: $2x^2 - 2x - 1 = 0$

8. **Find x, $\angle A$, and $\angle B$**

9. a) **Why** are $\triangle ACD$ and $\triangle BCD$ **congruent?**
   b) **Find** x
   c) **Find** the **area** of $\triangle ABC$

10. **Simplify:**

    a) $\dfrac{2x^2 - 3x - 14}{x + 2}$

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

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

11. $\left(2 + \sqrt{3}\right)\left(2 + \sqrt{3}\right) =$

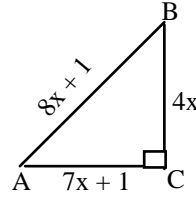12. **Solve** for x: $\dfrac{5x+3}{9} - \dfrac{x+1}{3} = 2$

13. Simplify: $\sqrt{\dfrac{2a^2b^3}{3}}$

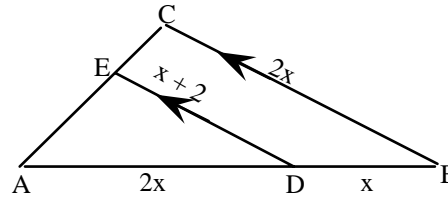**14. a) Divide** by **long division**: $\dfrac{3x^2 - 2x + 3}{x + 2}$

b) Combine: $\dfrac{5x}{x^2 - x - 6} - \dfrac{2}{x - 3}$

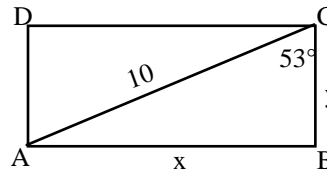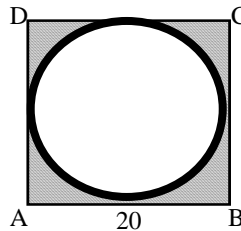**15. Solve** using the **quadratic formula**: $x^2 + 2x - 1 = 0$

16. Find x, AB, BC, and **AC**

17. a) State the **relationship** of $\triangle ABC$ to $\triangle ADE$
   b) Find x, AB, AD, BC, and **DE**

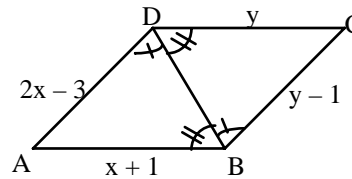**18. Find x, y** and **the area** of the rectangle. Leave answers to the nearest tenth.
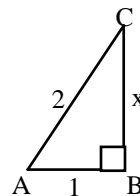   sin 53° = .7986
   cos 53° = .6018
   tan 53° = 1.3270

19. a) Find the **area** of the square ABCD.
   b) Find the **area** and the **circumference** of the circle.
   c) Find the **area** of the **shaded** part.

20. a) Why are $\triangle ABD$ and $\triangle CDB$ **congruent**?
   b) Which sides of the congruent triangles are equal?
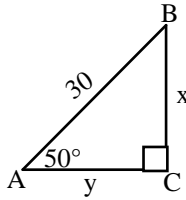   **c) Find x** and **y.**

21. a) Find x
   b) Find sin A, cos A, and **tan A**.

22. a) Find x and y (to the nearest tenth)
   b) Find the **area** of $\triangle ABC$
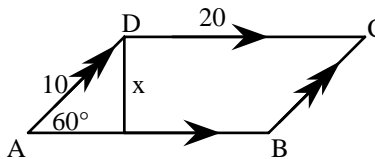
   $\sin 50° = .7660$
   $\cos 50° = .6428$
   $\tan 50° = 1.1918$

23. a) What is the relationship which exists
   between $\triangle ABC$ and $\triangle EFG$?
   b) Find x.
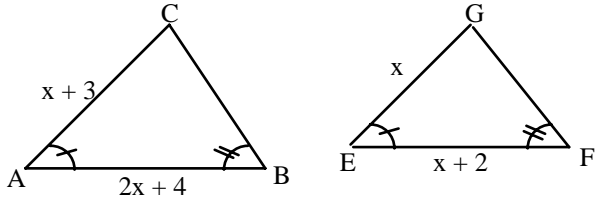
24. a) Find x (leave the answer in radical form)
   b) Find the **area** of the parallelogram ABCD.
   (Leave the answer in radical form)

25. a) Find x and y
   b) Find AB and **BC**
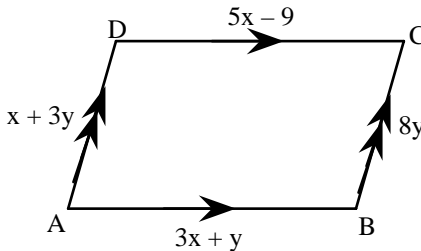
26. a) Explain why $\triangle DEC$ is similar to $\triangle ABC$.
   b) Find x
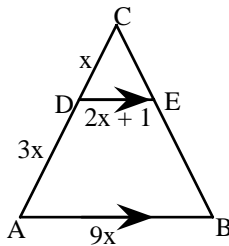
27. Find the **area** of the parallelogram ABCD to
   the nearest tenth, if $BE \perp AD$, $ED = 8$, $BC = 12$,
   $\angle A = 55°$
   $\sin 55° = .8192$
   $\cos 55° = .5735$
   $\tan 55° = 1.4281$
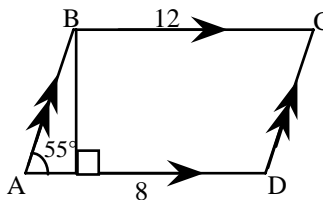
ANSWERS:

1. $2x + 7$

2. $x = 5$

3. $x = 8$; $x = 3$ (reject)

4. a) $2\sqrt{2}$

   b) $\dfrac{9xy - 10}{12y^2}$

5. a) $\dfrac{8\sqrt{3}}{15}$

   b) $3\left(\sqrt{3} + \sqrt{2}\right)$

6. $(4, 3)$

7. $\dfrac{1 \pm \sqrt{3}}{2}$

8. $x = 7$; $x = -10$ (reject)
$\angle A = 42$; $\angle B = 98$

9. a) $AD = BD$; $\angle ADC = \angle BDC$
     $CD = CD$; SAS
   b) $x = 2\sqrt{13}$
   c) 24 sq. units

10. a) $2x - 7$

    b) $\dfrac{2}{x^7}$

    c) $9x^{10}$

11. $7 + 4\sqrt{3}$

12. $x = 9$

13. $\dfrac{ab\sqrt{6b}}{3}$

14. a) $3x - 8 + \dfrac{19}{x + 2}$

    b) $\dfrac{3x - 4}{(x - 3)(x + 2)}$

15. $-1 \pm \sqrt{2}$

16. $x = 2$; $AB = 17$; $BC = 8$;
    $AC = 15$

17. a) $\triangle ABC \sim \triangle ADE$ (triangles
     are similar)
    b) $x = 6$; $AB = 18$; $AD = 12$;
     $BC = 12$; $DE = 8$

18. $x = 8$; $y = 6$; Area = 48 sq.
     units

19. a) 400 sq. units
    b) Area of circle = 314 sq.
        units
       Circumference = 62.8 units
    c) 86 sq. units

20. a) $\triangle ADB = \triangle CBD$;
     $DB = DB$; $\angle ABD = \angle CDB$
     ASA
    b) $AB = DC$; $AD = BC$
    c) $x = 3$; $y = 4$

21. a) $\sqrt{3}$

    b) $\sin A = \dfrac{\sqrt{3}}{2}$; $\cos A = \dfrac{1}{2}$
       $\tan A = \sqrt{3}$

22. a) $x = 23$; $y = 19.3$
    b) 222

23. a) $\triangle ABC \sim \triangle EFG$ (similar)
    b) $x = 3$

24. a) $5\sqrt{3}$
    b) $100\sqrt{3}$ sq. units

25. a) $x = 5$; $y = 1$
    b) $AB = 16$; $BC = 8$

26. a) $\angle CAB = \angle CDE$;
     $\angle CBA = \angle CED$
     corresponding angles are =
     (angles on the same side of
     2 ∥ lines and on the same
     side of the transversal). If 2
     angles in a $\triangle$ are = to 2 $\square$ s
     in a second $\triangle$, the $\triangle$'s are
     similar.
    b) $x = 4$

27. 68.4 sq. units