MTH 111, Exam #3, Part 1, Fall 2020 Name KEY

Instructions: For this portion of the exam, you may use the geometry formula sheet provided by your instructor, and a scientific calculator to find the solutions to the questions. You will then post the answers to those questions in Canvas under Exam #3 Part 1. You may not use other people or notes to complete the exam, and while submitting the exam you will be required to use the Lockdown Browser. After completing this exam, also submit you work and answers for Part 2 in the Part 2 submission folder.

Academic Integrity Statement

I affirm that, I, _____ (student name), do attest that I alone am completing the problems on this test without receiving unauthorized assistance. I understand that violations of academic integrity may result in sanctions, up to and including expulsion from the college.

_____(Student Signature)

_____(Student ID number)

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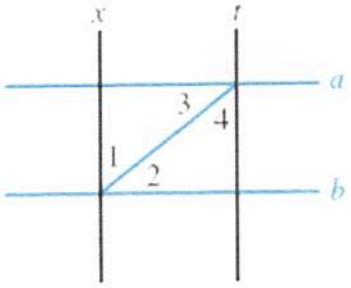
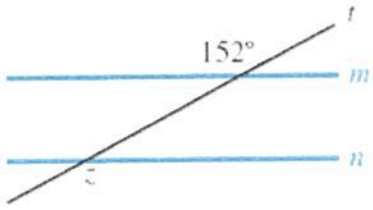
Every answer is worth 5 points.

1. Assume that $a \parallel b$ and $x \parallel t$. If $\angle 2 = 48°$ and $\angle 4 = 42°$, which, if any, sets of lines are perpendicular?



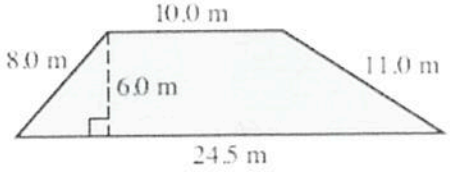
$x \perp a$
$x \perp b$
$t \perp a$
$t \perp b$

2. Assuming that lines m and n are parallel, what is the value of $\angle z$?



152°

3. Find the area and perimeter of the trapezoid.



perimeter: 53.5 m

area: $\frac{1}{2}(10+24.5)\,6 = 103.5\ m^2$

4. A rectangular lot is 155 ft × 175 ft. The house, driveway, and walks cover 7100 ft^2. What percent of the lot is lawn?

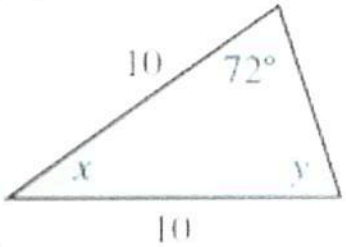
$155 \times 175 = 27125$

$-\ 7100$

$20{,}025$ lawn

$\frac{20{,}025}{27125} = 73.8\%$

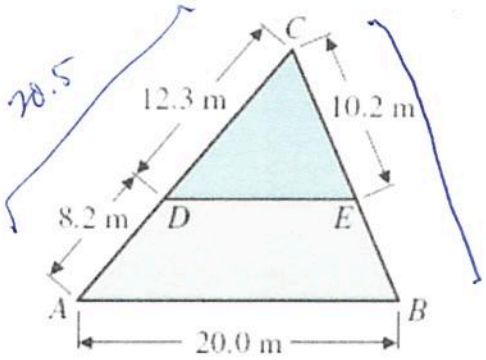
5. Find the values of the missing angles, x, y.



$y = 72$

$x = 36$

6. Find the length of $\overline{DE}$ and $\overline{EB}$.



$\frac{20.5}{X} = \frac{12.3}{10.2}$

$12.3X = 209.1$

$X = 17$

$CB = 17$

$EB = 17 - 10.2 = \boxed{6.8}$

$\frac{20.5}{20.0} = \frac{12.3}{X}$

$20.5X = 246 \Rightarrow DE = \boxed{12}$

7. A circle has a radius of 16 cm. Find the circumference and the area.

Circumference $= 2\pi(16) = 100.53$ cm

Area $= \pi(16)^2 = 804.25\ cm^2$

8. How many degrees are in a $\frac{\pi}{6}$ radian angle?

$\frac{\pi}{6} \cdot \frac{180^\circ}{\pi} = 30^\circ$

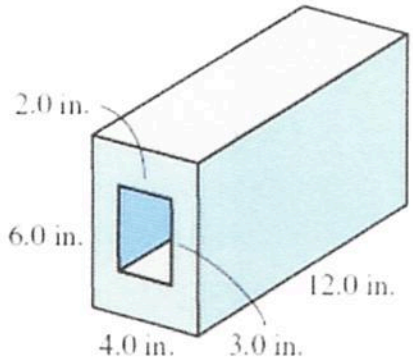
9. A central angle in a circle has a measure of 60°. If the radius is 12 cm, what is the length of the arc? What is the area of the sector?

$60^\circ = \frac{\pi}{3}$ rad.

$S = r\theta = 12 \cdot \frac{\pi}{3} = 12.6$ cm

$A = \frac{1}{2}r^2\theta = \frac{1}{2}(12)^2\frac{\pi}{3} = 75.4\ cm^2$

10. Find the volume of the sleeve.

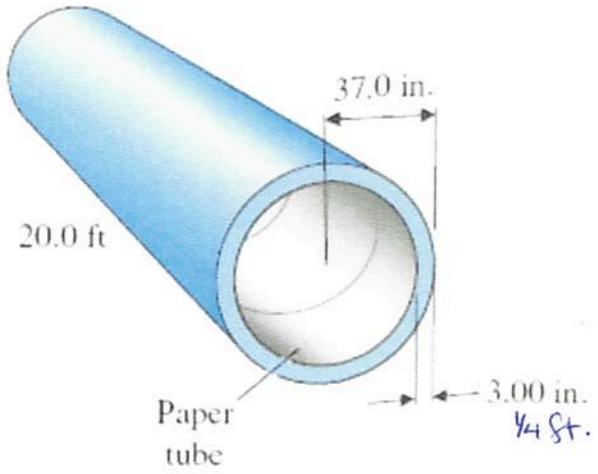


outside $= 4 \times 6 \times 12 = 288 \text{ in}^3$

inside $= 2 \times 3 \times 12 = 72 \text{ in}^3$

what's left $= 288 - 72 = 216 \text{ in}^3$

11. A diagram of a paper tube is shown below. Find the volume of paper making up the tube.



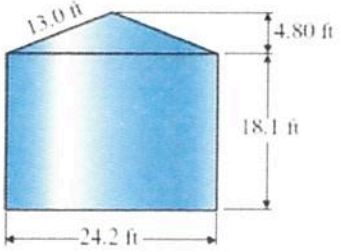
outside $= \pi(37)^2 20 = 86016.8 \text{ in}^3$

inside $= \pi(36.75)^2(20) = 84{,}858.3 \text{ in}^3$

tube $= 86016.8 - 84{,}858.3 =$

1158.5 in^3

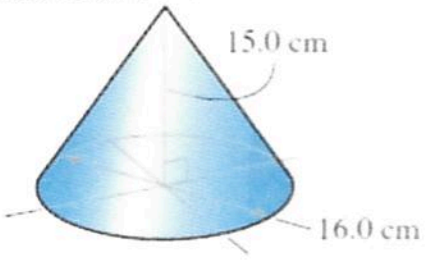
12. Find the volume and surface area of the tank. (prism)



Base $= \frac{4.8 \cdot 24.2}{2} = 58.08$

Volume $= 58.08 \times 18.1 = 1051.248 \text{ ft}^3$

13. Find volume of the cone.



$V = \frac{1}{3}\pi r^2 h =$

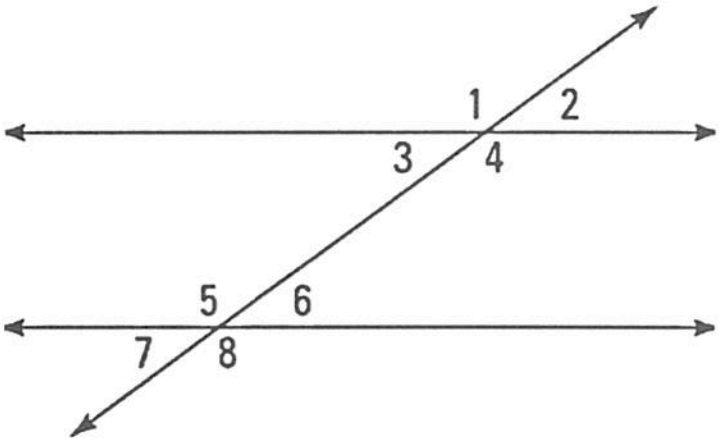
$\frac{1}{3}(\pi)(8)^2(15) = 1005.3\ cm^3$

14. Spherical tank has a diameter of 35 ~~ft~~ Find the volume of the water in the tank. If water weighs 62.4 lb/ft^3, what is the weight of the water the tank can hold?

volume $= \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(35)^3 = 179,594.4$ ~~ft^3~~

$\times 62.4 = 11,206,689.31$ lbs

15. Using diagram below, identify the following pairs of angles as a) interior, b) exterior, c) alternate interior, d) alternate exterior, e) vertical.



i. ∠1 and ∠4 vertical E
ii. ∠8 and ∠1 alt. exterior D
iii. ∠5 and ∠4 alt. interior C
iv. ∠2 and ∠8 exterior B
v. ∠3 and ∠5 interior A

MTH 111, Exam #3, Part 2, Fall 2020 Name KEY

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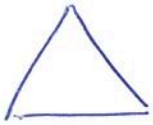
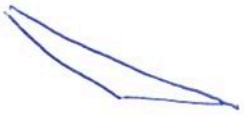
1. Draw an example of an acute angle.

2. What is the difference between a regular and an irregular polygon? Illustrate with a drawing on each.

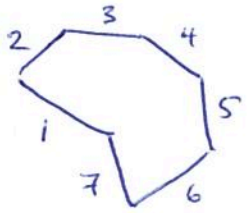
regular polygons have equal sides and angles everywhere



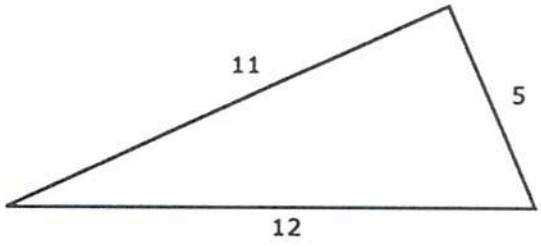
vs.



3. Draw an example of a heptagon.



4. Find the area of the triangle using Heron's formula.

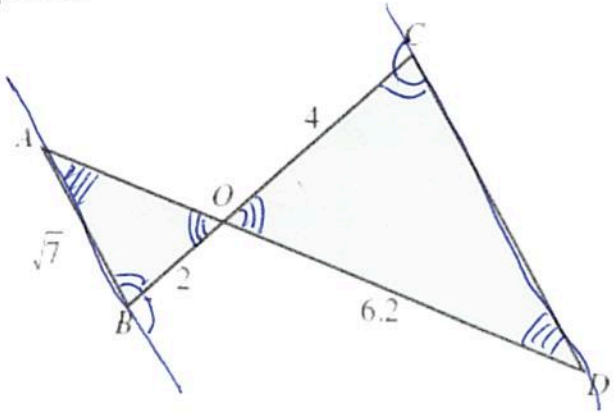


$s = \frac{1}{2}(11+12+5) = 14$

$\sqrt{14(14-11)(14-12)(14-5)} =$

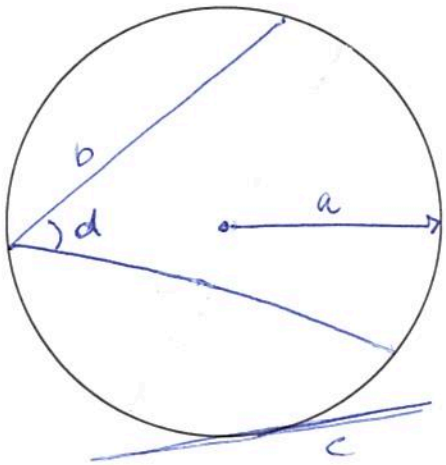
$\sqrt{756} = 27.5 \text{ units}^2$

5. Is triangle ABO similar to triangle DCO? Why or why not? Explain. Assume that $\overline{AB}$ and $\overline{CD}$ are parallel.



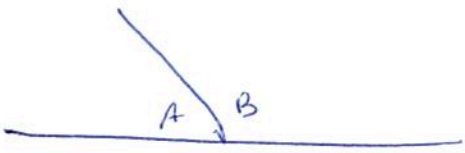
yes, they are similar
since all angles are equal
(corresponding)

6. On the circle below, draw a) a radius, b) a chord, c) a tangent, d) an inscribed angle. Label each clearly.

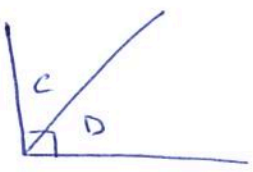


7. Explain the difference between supplementary angles and complementary angles. Give an example of each.

Supplementary adds to 180°
Complementary adds to 90°



Supplementary



Complementary