

ACT
PRACTICE

① $3\frac{3}{5} = X + 2\frac{2}{3} \quad X = ?$

② What number can you add to the numerator AND denominator of $\frac{7}{9}$ to get $\frac{1}{2}$?

① $\frac{18}{5} = X + \frac{8}{3}$

$$X = \frac{54}{15} - \frac{40}{15} = \boxed{\frac{14}{15} = X}$$

② $\frac{7+X}{9+X} = \frac{1}{2} \quad \therefore 7+X = \frac{9+X}{2}$

$$2(7+X) = 9+X$$

$$14+2X = 9+X$$

$$\boxed{X = -5}$$

Geometry 1 - Homework Review

Verify $\cot^2 \theta + 1 = \csc^2 \theta$

$$\cot^2 \theta + 1$$

$$\frac{\cos^2 \theta}{\sin^2 \theta} + 1$$

$$\frac{\cos^2 \theta}{\sin^2 \theta} + \frac{\sin^2 \theta}{\sin^2 \theta}$$

$$\frac{\cos^2 \theta + \sin^2 \theta}{\sin^2 \theta}$$

$$\frac{1}{\sin^2 \theta}$$

$$\csc^2 \theta$$

$$\csc^2 \theta$$

$$\csc^2 \theta$$



Combining the trig. identity we verified in class with last night's homework plus "the biggie" gives you the 3:

PYTHAGOREAN IDENTITIES

*

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

You can easily get the last 2 from #1

$$\sin^2 \theta + \cos^2 \theta = 1$$

DIVIDE BY $\cos^2 \theta$

$$\frac{\sin^2 \theta}{\cos^2 \theta} + \frac{\cos^2 \theta}{\cos^2 \theta} = \frac{1}{\cos^2 \theta}$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$\sin^2 \theta + \cos^2 \theta = 1$$

DIVIDE BY $\sin^2 \theta$

$$\frac{\sin^2 \theta}{\sin^2 \theta} + \frac{\cos^2 \theta}{\sin^2 \theta} = \frac{1}{\sin^2 \theta}$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

Verify $\cos \theta \tan \theta \csc \theta = 1$

$$\cos \theta \tan \theta \csc \theta$$

$$\frac{\cos \theta \sin \theta}{\cos \theta} \cdot \frac{1}{\sin \theta}$$

$$\frac{\sin \theta}{\sin \theta} = 1$$

$$1$$

$$1$$

✓

Verify $\frac{\cos x - \sin x}{\cos x} = 1 - \tan x$

$$\frac{\cos x - \sin x}{\cos x}$$

$$\frac{\cos x}{\cos x} - \frac{\sin x}{\cos x}$$

$$1 - \tan x$$

$$1 - \tan x$$

$$1 - \tan x$$

✓

Verify $\tan^2 \theta + \sec^2 \theta = 2\sec^2 \theta - 1$

$\tan^2 \theta + \sec^2 \theta$		$2\sec^2 \theta - 1$
---------------------------------	--	----------------------

Using PI $\Rightarrow$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

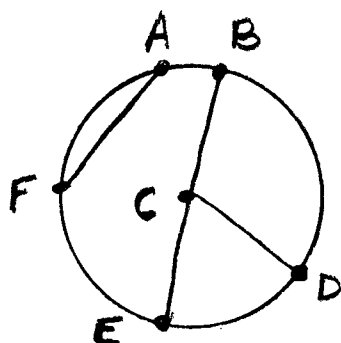
$$\tan^2 \theta = \sec^2 \theta - 1$$

$$\therefore \sec^2 \theta - 1 + \sec^2 \theta$$

$$2\sec^2 \theta - 1$$

$$2\sec^2 \theta$$

Ch. 10 Circles and Circumference



CIRCLE - locus of ALL points in a plane
Equidistant from A center point.

Chord - A line segment with end points
on the circle. Ex) $\overline{AF}$

diameter - A chord that passes through center
Ex) $\overline{BE}$ ALL dia. $\cong$

RADIUS - A line segment from the center
to any point on the circle
Ex) $\overline{CB}$, $\overline{CE}$, $\overline{CD}$ ALL radii are $\cong$

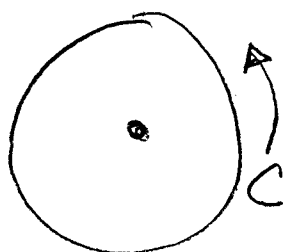
Plural
is radii

How to name: the above circle is
circle C or $\odot C$

↑
center point

Two circles are congruent if their radii are $\cong$
OR diameters are congruent

Circumference distance around A circle.



$C = \text{circumference}$

$$C = 2\pi r$$

or

$$\text{Since } 2r = d$$

$$C = \pi d$$

Ex 4
Pg 524

Ⓐ Find C if $r = 7\text{ cm}$

$$C = 2\pi r = 2\pi(7) = 14\pi\text{ cm}$$

EXACT

$$= 14(3.14)$$

$$= 43.98\text{ cm}$$

APPROXIMATE

Ⓑ Find C if $d = 12.5\text{ in}$

$$C = \pi d = \pi(12.5) = 12.5\pi\text{ in}$$

EXACT

$$= 39.27\text{ in}$$

Approx.

© find d and r to nearest hundredth
if $C = 136.9 \text{ m}$

$$C = 2\pi r = \pi d \quad \therefore 136.9 = 3.142d$$

$$\frac{136.9}{3.142} = d$$

$$43.576 \approx d$$

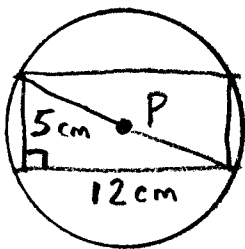
$$\boxed{d \approx 43.58 \text{ m}} \quad r = \frac{43.576}{2} \approx 21.788$$

$$\boxed{r \approx 21.79 \text{ m}}$$

- To get nearest hundredth, don't round to less than thousandth until end.
- if calculator has π built-in, use it to avoid rounding errors until end.
- include units !!!
- Answer the questions $\uparrow$
- use $\approx$ for approximately

EX5 Other figures may be involved.
Pg 525

Find C
 (EXACT)



P = diameter, Pythagorean Theorem $\Rightarrow$

$$P^2 = 5^2 + 12^2 \quad \therefore P = \sqrt{25 + 144}$$

$$P = \sqrt{169}$$

$$P = 13$$

$$\therefore C = 2\pi r = \pi d = \pi 13$$

$$\boxed{C = 13\pi \text{ cm}}$$

Homework:

Verify the following trig. identities:

$$\textcircled{1} \quad \csc \theta = \cot \theta \sec \theta$$

$$\textcircled{2} \quad \sec \theta - \cos \theta = \tan \theta \sin \theta$$

$$\textcircled{3} \quad \cos \theta = \sec \theta - \tan \theta \sin \theta$$

$$\textcircled{4} \quad \cos^2 x - \sin^2 x = 2\cos^2 x - 1$$

Page 526 # 21-27, 44, 46, 52
