Geometry 1 - BE Tuesday 1-18-11

ACT PRACTICE

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

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

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① $\frac{18}{5} = X + \frac{8}{3}$

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

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

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

$14+2X = 9+X$

$\boxed{X = -5}$

Geometry 1 – Homework Review

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

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

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

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

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

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

$\csc^2\theta$ | $\csc^2\theta$ ✓

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

$\cos\theta \tan\theta \csc\theta$ | 1

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

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

1 | 1 ✓

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

$\frac{\cos x - \sin x}{\cos x}$ | $1 - \tan x$

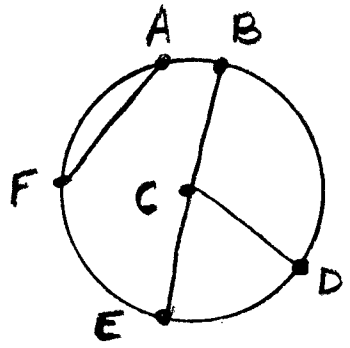
$\frac{\cos x}{\cos x} - \frac{\sin x}{\cos x}$

$1 - \tan x$ | $1 - \tan x$ ✓

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. $\cong$

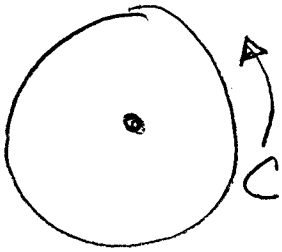
RADIUS – A line segment from the center to ANY point on the circle
Ex) $\overline{CB}$, $\overline{CE}$, $\overline{CD}$ ALL radii are $\cong$

(Plural is radii)

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

Two circles are congruent is their radii iff OR diameters are congruent

Circumference distance around a circle.



C = circumference

$$C = 2\pi r$$

or

Since $2r = d$

$$C = \pi d$$

Ex 4 Pg 524

(A) Find C if $r = 7$ cm

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

EXACT

$$= 14(3.14)$$

$$= \boxed{43.98 \text{ cm}}$$

APPROXIMATE

(B) Find C if $d = 12.5$ in

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

EXACT

$$= \boxed{39.27 \text{ in}}$$

Approx.

© find d and r to nearest hundredth if $C = 136.9$ m

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

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

$$43.576 \approx d$$

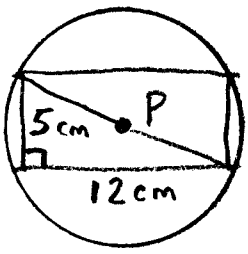
$\boxed{d \approx 43.58\text{m}}$ $r = \frac{43.576}{2} \approx 21.788$

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

- 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
- use ≈ for approximately

EX 5 PG 525 Other figures may be involved.

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:

1. $\csc\theta = \cot\theta \sec\theta$
2. $\sec\theta - \cos\theta = \tan\theta \sin\theta$
3. $\cos\theta = \sec\theta - \tan\theta \sin\theta$
4. $\cos^2 x - \sin^2 x = 2\cos^2 x - 1$

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