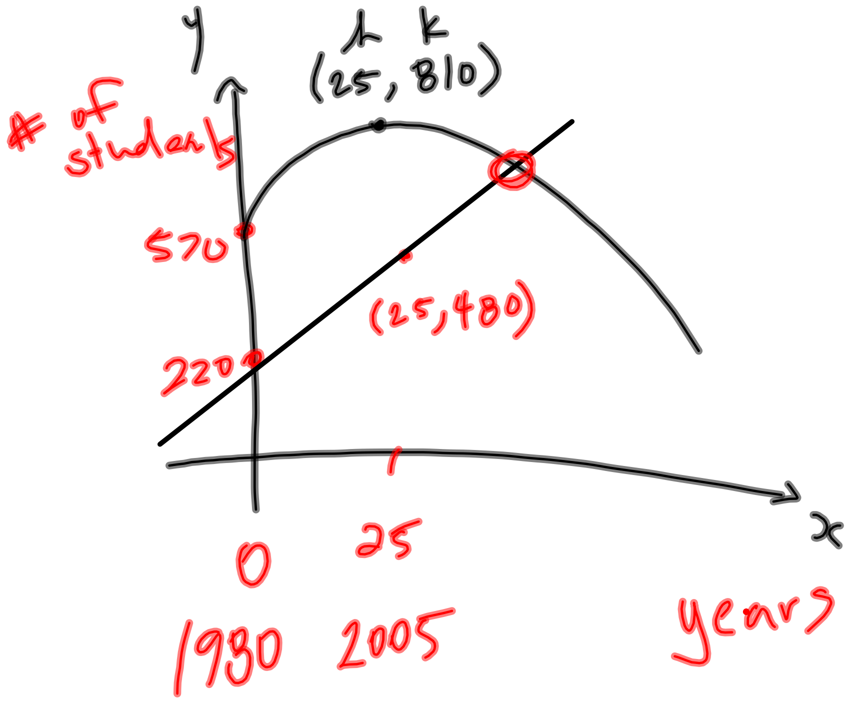
~~#2~~

POI

girls



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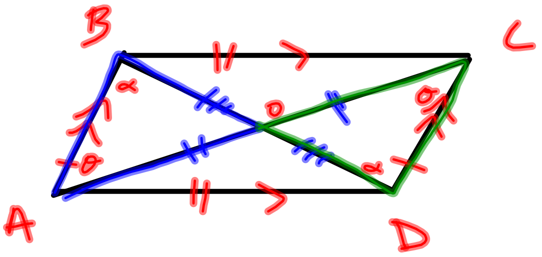


Hypothesis

- ABCD is a //ogram
- AC and BD are diagonals

X SSS

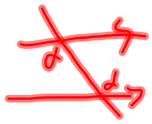
ASA

X SAS

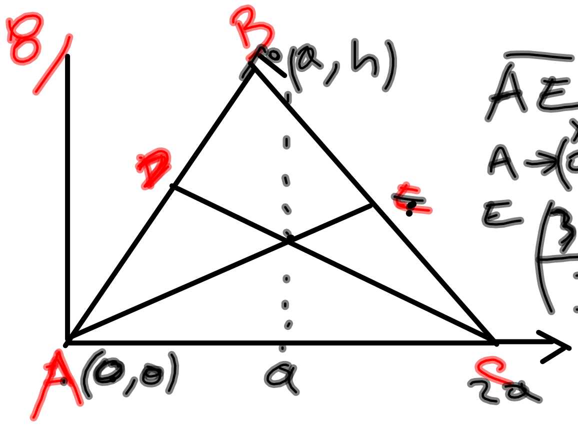
Conclusion:

∴ $AO \cong OC$ $BO \cong OD$

Statements	Justification
$\overline{AB} = \overline{DC}$	hypo (ABCD is a //ogram
$\angle ABO = \angle ODC$	∴ alternate interior angle
$\angle BAO = \angle OCD$	" " "
∴ $\triangle BAO \cong \triangle CDO$	ASA
$AO \cong OC$	corresponding sides of congruent Δ's
$BO \cong OD$	" " "



$\boxed{\equiv}$



$\overline{AE} \to$

$A \to (\overset{x_1}{0}; \overset{y_1}{0})$

$E\left(\underset{x_2}{\frac{3a}{2}}; \underset{y_2}{\frac{c}{2}}\right)$

1

$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$d=\sqrt{\frac{3a}{2}}$

$\overline{AE} \to$

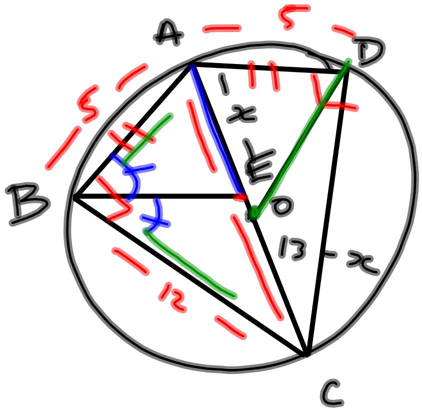
Q6

$\overline{AB} = 5$

$\overline{BC} = 12$

$\overline{AB} = \overline{AD}$

AC - diameter



$AC = \sqrt{5^2 + 12^2}$

$AC = 13$

$\text{radius} = \frac{13}{2} = 6.5$

Th 80 (bisector)

$$\frac{AE}{AB} = \frac{EC}{BC}$$

$$\frac{x}{5} = \frac{13-x}{12}$$

$$12x = 5(13-x)$$

$$12x = 65 - 5x$$

$$12x + 5x = 65$$

$$\frac{17x}{17} = \frac{65}{17}$$

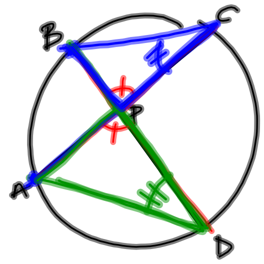
$$AE: \boxed{x = 3.82}$$

Q10

Conclusion:

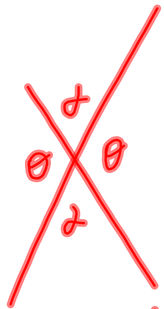
$\overline{PA} \times \overline{PC} = \overline{PB} \times \overline{PD}$

(Th 81)



Think ARCS!

	Justification
	• opposite angle
	• Th 77 (inscribed) shared arc $\overset{\frown}{AB}$
	• AA-AA
4, $\frac{mPA}{PB} = \frac{PD}{PC} = K$	• with similar Δs, the ratios of corresponding sides equal each other.
$PA \times PC = PB \times PD$	• cross multiple/algebra



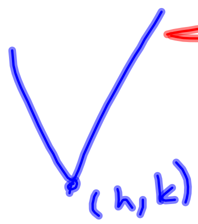
Q15 $j(x) = \log_3(2x - 3)$ $k(x) = \frac{1}{2}x + 3$

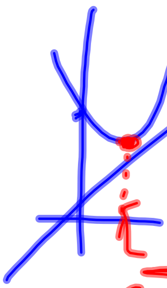
exp / absolute / line / parabola — you must know how to graph it!

- $j \circ k(x)$

- characteristics of functions:
  - x-ints
  - increasing...
  - y-ints
  - DOMAIN
  - RANGE
  - MAX/MIN

sin/cos





$f(x) = x + 3$

$g(x) = x^2 + 6x + 9$

$[\quad] \quad x = 0 \quad V\left(\frac{-b}{2a}, \frac{-\Delta}{4a}\right)$

b) Do $g(x)$ and $g/f(x)$ have the same increasing interval

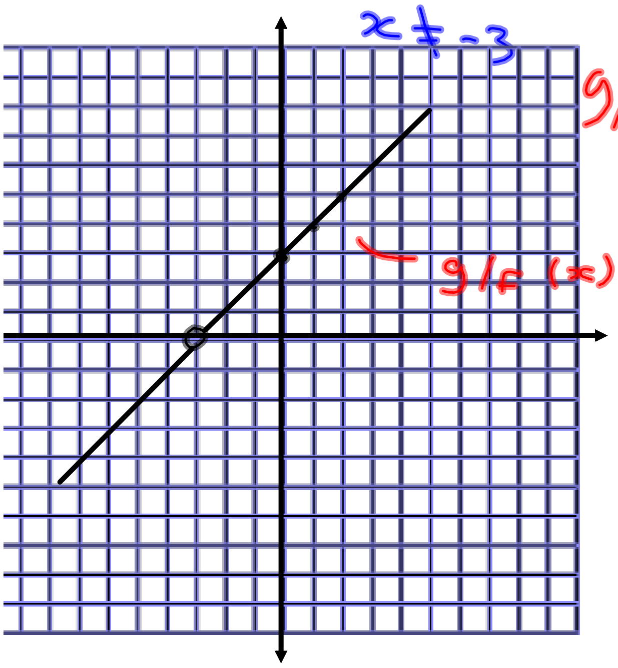
$g/f(x) = \frac{g(x)}{f(x)} = \frac{x^2 + 6x + 7}{x+3}$ factor

$= \frac{\cancel{(x+3)}(x+3)}{\cancel{x+3}}$

$f(x) \neq 0$

$x + 3 \neq 0$

$x \neq -3$



$g/f(x) = x + 3$

$x \neq -3$

Domain: $\mathbb{R} \setminus -3$

$y = 0$

$f(x) = 2\cos x$ $\quad g(x) = -x + 2$

$f \circ g\,(x) = f(g(x)) = f(-x+2)$

$f \circ g(x) = 2\cos(-x+2)$

$= 2\cos -(x-2)$

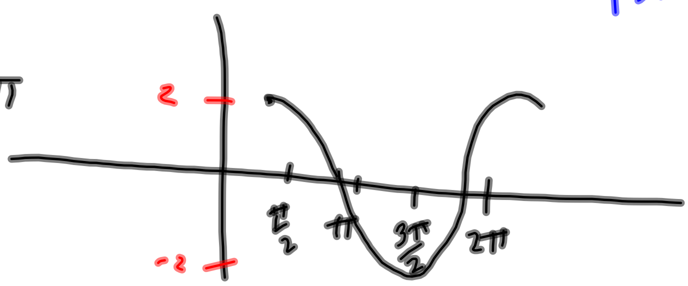
$a = 2$
$b = -1$ $\quad k = 0$
$h = 2$

- $y = k$
- $y = 0$
- central axis

$f(x) = a\cos b(x-h)+k$ starting point cos: $(h, k+a)$

Do $f \circ g(x)$ and $f(x)$ have the same zeros (x-ints)

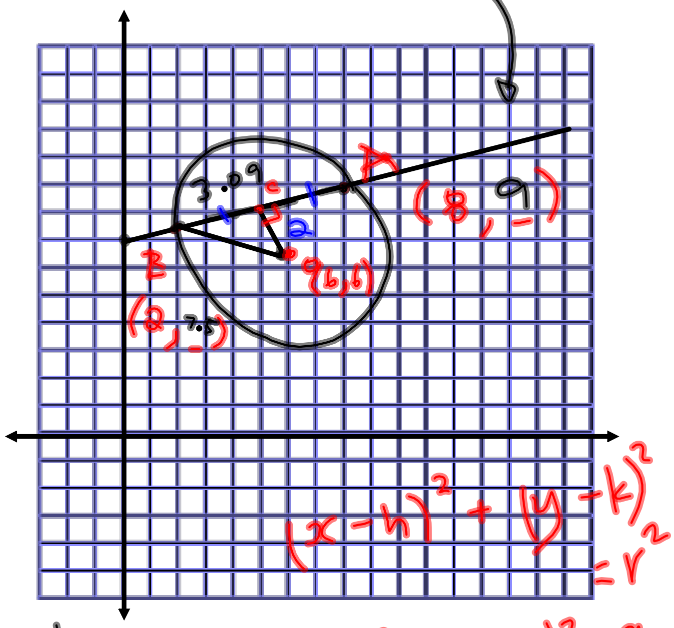
- amplitude : 2
- period $\frac{2\pi}{|b|} = 2\pi$



Q16 $f(x) = \frac{x}{4} + 7$

$\overline{BA}$ is a chord on the circle.

$\overline{CO} = 2$ units.



$f(2) = \frac{2}{4} + 7$

$f(2) = 7.5$ B$(2, 7.5)$

$f(8) = \frac{8}{4} + 7$ A$(8, 9)$

$= 9$

$d_{AB} = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$

$d_{AB} = \sqrt{(8-2)^2 + (9-7.5)^2}$

$d_{AB} = 6.1846$

half $\cancel{2}$

$BC = 3.092$

① $(x-6)^2 + (y-6)^2 = 9$

② $y = \frac{x}{4} + 7$

Find POI:

sub ② into ①

$(x-6)^2 + (\frac{x}{4}+1)^2 = 9$

$(x-6)(x-6) + (\frac{x}{4}+1)(\frac{x}{4}+1) = 9$

$\frac{16x^2}{16} - 12x + 36 + \frac{x^2}{16} + \frac{2x}{4} + 1 = 9$

$\frac{17x^2}{16} - \frac{23}{2}x + 28 = 0$

Use Quad formula!

$ax^2 + bx + c = 0$

$x_1 = \frac{-b + \sqrt{\Delta}}{2a}$

$x_1 = \frac{-(-\frac{23}{2}) + \sqrt{13.25}}{2(\frac{17}{16})}$

$x_1 = 7.12$

$x_{11} = \frac{-b - \sqrt{\Delta}}{2a}$

$x_{11} = 3.7$

$\Delta = b^2 - 4ac$

$\Delta = (-\frac{23}{2})^2 - 4(\frac{17}{16})(28)$

$\Delta = 13.25$

$a = \frac{17}{16}$

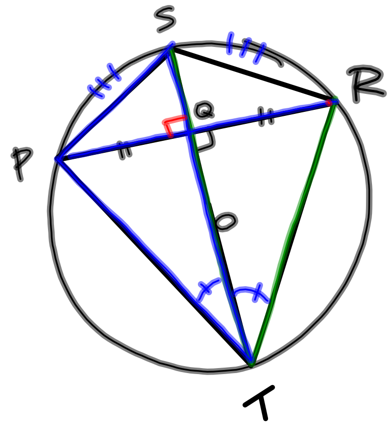
$b = -\frac{23}{2}$

$c = 28$

Prove th 71

Hypo: radius OS is ⊥ $\overline{PR}$

Statement	
$\overline{PQ} \cong \overline{QR}$	Th 71
$\angle PQS \cong \angle RQS = 90°$	Hypothesis
$\overline{SQ} = \overline{SQ}$	Shared side
ΔPSQ is congruent ΔSQR	SAS
$\angle SPQ \cong \angle SRQ$	corresponding angles in congruent Δ's
$\therefore \widehat{SP} \cong \widehat{SR}$	Th 77 (inscribed angles) the arcs are subtended by the congruent angles.



$$(f/g)(x) = \frac{f(x)}{g(x)}$$

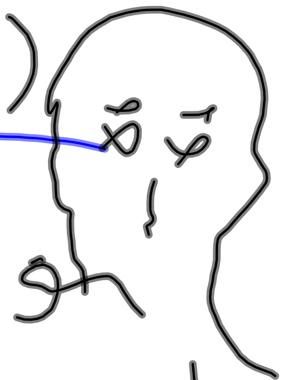
$x = -1$

$$(f/g)(-1) = \frac{0}{-4} = 0$$

$f(-1) = 0$

$\longrightarrow (-1, 0)$

$g(-1) = -4$



$f(1) = -4$

$g(1) = -2$

$x = 1$

$$(f/g)(1) = \frac{f(1)}{g(1)} = \frac{-4}{-2} = 2$$

$(1, 2)$

hehe!