11.7

C.E.

(1) $\frac{9}{5}$ (2) $\left(\frac{12}{9}\right)^2 = \left(\frac{4}{3}\right)^2 = \frac{16}{9}$ (3) $\frac{10}{12} = \frac{5}{6}$

	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sc. Factor	1:3	1:5	3:4	2:3	4:5	3:5	4:7	6:5
Ratio of P	1:3	1:5	3:4	2:3	4:5	3:5	4:7	6:5
Ratio of A	1:9	1:25	9:16	4:9	16:25	9:25	16:49	36:25

(12) a) yes

b) $\frac{18\pi}{24\pi} = \frac{3}{4}$ $\frac{81\pi}{144\pi} = \frac{9}{16}$

(13) a) No

b) $\triangle ADE \sim \triangle ABC$

c) $\left(\frac{2}{5}\right)^2 = \frac{4}{25}$

d) 4:21

(14) a) 8:5

b) 8:15

c) 1:1

(15) a) 7:4

b) 49:16

W.E.

	①	②	③	④	⑤	⑥	⑦	⑧
Scale factor	1:4	3:2	r:2S	9:5	3:13	5:1	3:8	$\sqrt{2}:1$
Ratio of perim.	1:4	3:2	r:2S	9:5	3:13	5:1	3:8	$\sqrt{2}:1$
Ratio of Areas	1:16	9:4	$r^2:4S^2$	81:25	$9:169$	25:1	9:64	2:1

(proof)

(10) $36\pi = \pi r^2$

$6 = r$

$64\pi = \pi r^2$

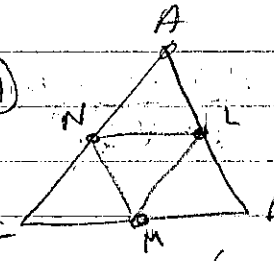
$8 = r$

$\frac{12}{16} = \frac{3}{4}$

$\left(\frac{36\pi}{64\pi} = \text{square of scale factor}\right.$

$\left.\frac{6}{8} = \text{scale factor}\right)$

(11)

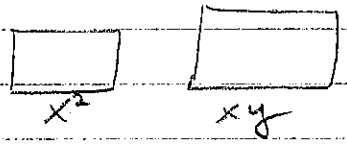


Perim. → 2:1 (Sim. Δ's)

Area → 4:1

(seg. joining mdpts of 2 sides = ½ length of 3rd side)

(12)



$\text{Scale factor} = \frac{x^2}{xy} = \frac{x}{y}$

$\text{ratio of Areas} = \frac{x^2}{y^2}$

(13) $\triangle ABE \sim \triangle DCE$ (AA~ → inscribed ∠ intersepts same chord)

scale factor = 6:5 → ratio of areas = **36:25**

$\frac{6}{5} = \frac{8}{DE}$

$40 = 6 \cdot DE$

$\frac{40}{6} = \boxed{DE = \frac{20}{3}}$

(14) $\triangle ACD \sim \triangle AEB$

Scale factor = 10:9 → ratio of areas = **100:81**

$\frac{10}{9} = \frac{20}{10+DE}$ $\quad 18 = 10 + DE$

$\boxed{8 = DE}$

(15) scale factor $= \frac{9}{15} = \frac{3}{5}$ ratio of areas $= \frac{9}{25}$

$\frac{9}{25} = \frac{45}{x} \Rightarrow 125 = x$

(16) ratio of areas $\frac{48}{27} \Rightarrow$ scale factor $= \frac{\sqrt{48}}{\sqrt{27}} = \frac{4\sqrt{3}}{3\sqrt{3}} = \frac{4}{3}$ = ratio of perim.

$P = 3 + 4 + 5 + 6 + 7 = 25$ $\quad \frac{4}{3} = \frac{25}{x}$

$4x = 75$

$\boxed{x = \frac{75}{4}}$

(17) $\frac{I}{II} = \frac{9}{7}$ (18) $\frac{I}{II} = \frac{3}{6} = \frac{1}{2}$ (19) $\frac{I}{II} = \frac{6}{8} = \frac{3}{4}$

$\frac{I}{III} = \frac{10}{8} = \frac{5}{4}$ $\quad \frac{I}{III} = \left(\frac{5}{10}\right)^2 = \frac{1}{4}$ $\quad \frac{I}{III} = \frac{6}{14} = \frac{3}{7}$ $\left[\frac{I}{I+II} = \frac{I}{III}\right.$

(area I + II = III
so 6 + 8 = 14)

(20) a) $\triangle TOS \sim \triangle QOP$ (AA ~) $\rightarrow \frac{6}{9} =$ scale factor $= \frac{2}{3} \Rightarrow \boxed{\frac{4}{9}}$

b) $\triangle TOS \sim \triangle TQR$ (AA ~) $\rightarrow \frac{6}{15} =$ scale factor $= \frac{2}{5} \Rightarrow \boxed{\frac{4}{25}}$

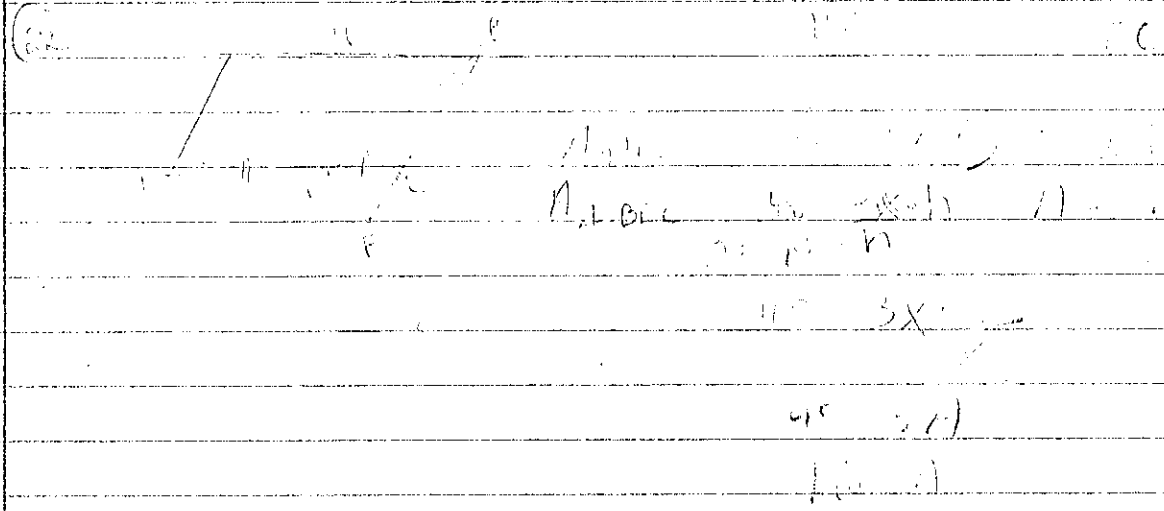
(21) $\triangle ABG \sim \triangle CEG$ (AA ~) $\rightarrow \frac{6}{10} = \boxed{\frac{9}{25}}$

$\triangle AGF \sim \triangle CGB$ " $\rightarrow \frac{3}{5} = \boxed{\frac{9}{25}}$

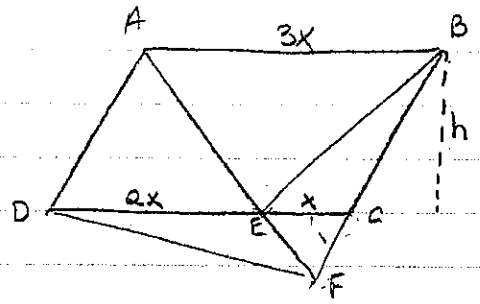
$\triangle EFD \sim \triangle EBC$ " $\rightarrow \frac{2}{5} = \boxed{\frac{4}{25}}$

$\triangle ABC \sim \triangle COA$ (SSS $\cong$) $\rightarrow \frac{6}{6} = \boxed{\frac{1}{1}}$

$\triangle ABF \sim \triangle DEF$ (AA ~) $\rightarrow \frac{6}{4} = \boxed{\frac{9}{4}}$



(22)



$A_{ABCD} = 48$

a) $A_{ABE} = \boxed{24\ cm^2}$ (A of $\square = bh$ + $A\ \triangle = \frac{1}{2}Bh$)
same base

b) $\triangle BEC$:
$A = \frac{1}{2}(EC)h$
$= \frac{1}{2}(\frac{1}{3}\cdot DC)h$ $(DC \cdot h = 48)$
$= \frac{1}{6}\cdot 48 = \boxed{8\ cm^2}$

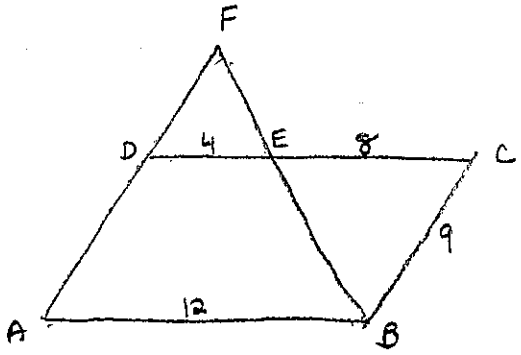
c) $\triangle ADE$:
$A = \frac{1}{2}(DE)h$
$A = \frac{1}{2}(\frac{2}{3}\cdot DC)h$ $(DC \cdot h = 48)$
$A = \frac{2}{6}\cdot 48 = \boxed{16\ cm^2}$

d) $\triangle CEF$:
$\triangle CEF \sim \triangle DEA \rightarrow$ sc. fact. $= \frac{1}{2} \rightarrow$ ratio of $A = \frac{1}{4}$
$\frac{16}{A} = \frac{4}{1} \rightarrow A = \boxed{4\ cm^2}$

e) $\triangle DEF$:
$\triangle DEF + \triangle ECF \rightarrow$ same height
$\frac{2x}{x} = \frac{A}{4}$
$\boxed{8\ cm^2} = A$

f) $\triangle BEF$:
$A_{BEF} = A_{BEC} + A_{ECF}$
$A = 8 + 4 = \boxed{12\ cm^2}$

(23)



a) $\frac{A_{\Delta DEF}}{A_{\Delta ABF}}$ Similar Δ's: sc. fact $\frac{4}{12} = \frac{1}{3}$ $\rightarrow$ ratio areas $\boxed{\frac{1}{9}}$

b) $\frac{A_{\Delta DEF}}{A_{\Delta CEB}}$ Similar Δ's: $\frac{4}{8} = \frac{1}{2}$ $\rightarrow$ $\boxed{\frac{1}{4}}$

c) $\frac{A_{\Delta DEF}}{A_{DEBA}}$ Trap. DEBA = Δ ABF $-$ Δ DEF
$(9x)$ (x)

$\frac{x}{9x-x} = \boxed{\frac{1}{8}}$