

مراجعة عامة

الهندسة

للصف الاول الثانوى ترم اول

اعداد الاستاذ / على حمدون

(١) معامل التشابه بين مضلعين متطابقين يساوي

(٢) إذا تتناسب أطوال الأضلاع المتناظرة في مثلثين فإنهما

(٣) إذا كان ك معامل تشابه المضلع من للمضلع م وكان $\lambda > 1$ فإنه المضلع م هو المضلع م

(٤) مضلعان متشابهان النسبة بين محيطيهما ٥:٣ فإنه النسبة بين مساحتيهما تساوي

(٥) مربعان النسبة بين طولي قطريهما ٤:٥ فإذا كانت مساحة أصغرهما ٤ كم^٢ فإنه مساحة أكبرهما

(٦) إذا كان Δ \sim Δ \sim Δ وكان $OP = 3$ فإنه $(OP, 5) : (5, 2) = (\Delta, 5) : (\Delta, 3) = \dots$

(٧) إذا كانت النسبة بين مساحتي مضلعين متشابهين هي ٣٦:٤٩ فإنه النسبة بين محيطيهما

(٨) جميع المضلعات المنتظمة التي لها نفس عدد الأضلاع تكون

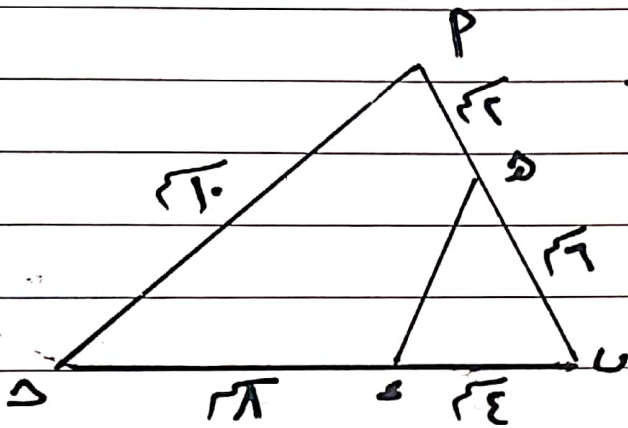
(٩) إذا رسمت من رأس القائمة في المثلث القائم الزاوية عموداً على الوتر انقسم المثلث إلى

(١٠) إذا كانت النسبة بين مساحتي سطحي مثلثين متشابهين هي ٣:٥ وكانت مجموع مساحتيهما ٦٨ سم^٢ فإنه مساحة كل منهما

(11) إذا كان $\Delta P \cup \Delta \sim \Delta \epsilon \cup \Delta$ وكان $\Delta \cup \Delta = \Delta \epsilon \cup \Delta$ و
 فإنه $\frac{m(\Delta \epsilon \cup \Delta)}{m(\Delta \cup \Delta)}$

(12) مستطيلان متشابهان بعد الأول $\Delta \epsilon \cup \Delta$ $\Delta \cup \Delta$ $\Delta \cup \Delta$
 ومحيط الثاني $\Delta \cup \Delta$ فإنه مساحته الثاني =

(13) في الشكل المقابل -



(أ) أثبت أن $\Delta \cup \Delta \sim \Delta \epsilon \cup \Delta$

(ب) أوجد طول \overline{DE}

(ج) برهن أن الشكل $\Delta \cup \Delta$

رباعي دائري

(د) أوجد

$m(\Delta \cup \Delta) : m(\Delta \cup \Delta)$

(هـ) أوجد $m(\Delta \cup \Delta) : m(\Delta \cup \Delta)$ (الشكل رباعي $\Delta \cup \Delta$)

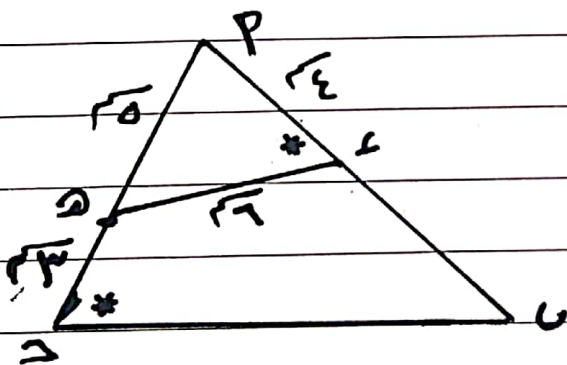
(14) في الشكل المقابل

إذا كان $\overline{PE} = \overline{PE} = \overline{PE}$

(أ) أثبت أنه

$\Delta \cup \Delta \sim \Delta \cup \Delta$

(ب) أوجد طول \overline{DE} و \overline{DE}

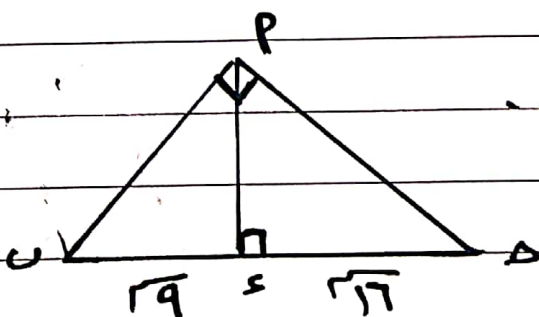


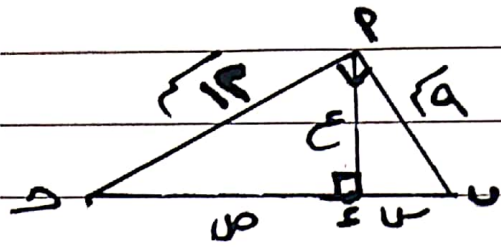
(15) في الشكل المقابل

(أ) $\Delta \cup \Delta \sim \Delta \cup \Delta \sim \Delta \cup \Delta$

(ب) أوجد طول

\overline{PE} و \overline{PE}



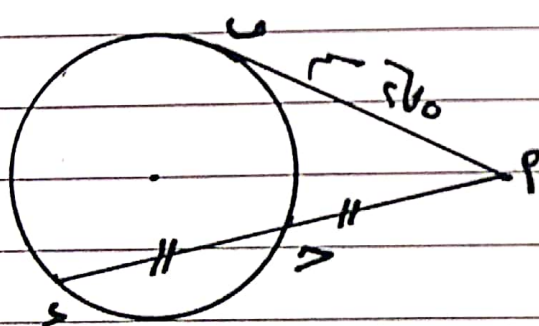


(١٦) في الشكل المقابل
 ΔPAB قائم الزاوية في P
 $PC \perp AB$ و $CB = 9$ و $PC = 14$
 فانه $AC = \dots = \dots$

(١٧) ΔPAB مثلث فيه $PA = 8$ و $PB = 10$ و $AB = 12$
 D و E نقطتين حيث $AD = 4$ و $BE = 4$ حيث $DE \parallel AB$
 أثبت أن (١) $\Delta PDE \sim \Delta PAB$ و أوجد طول DE
 (٢) ΔPDE رباعي دائري ثم اوجد (ΔPDE) و (ΔPAB)

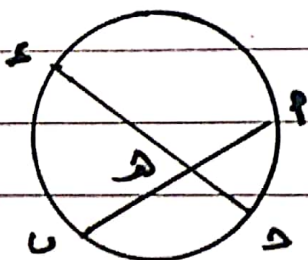
(١٨) ΔPAB فيه E منتصف AB حيث $PE = 5$ و $AB = 12$
 $PE \perp AB$ أثبت أن
 (١) $\Delta PEA \sim \Delta PEB$ (٢) $PE \perp AB$

(١٩) ΔPAB مثلث E و D نقطتين حيث $AE = 4$ و $BE = 8$ و $AD \parallel BE$
 حيث $DE \parallel AB$ فاذا كانت مساحة $\Delta PDE = 6$ كم؟
 أوجد مساحة شبه المنزلق $DEAB$



(٢٠) في الشكل المقابل
 (١) $PA \cdot PB = PC^2$
 $PA = 8$ و $PB = 12$ و $PC = 8$
 أثبت أن $PC \perp AB$

فانه $AD = \dots = \dots$

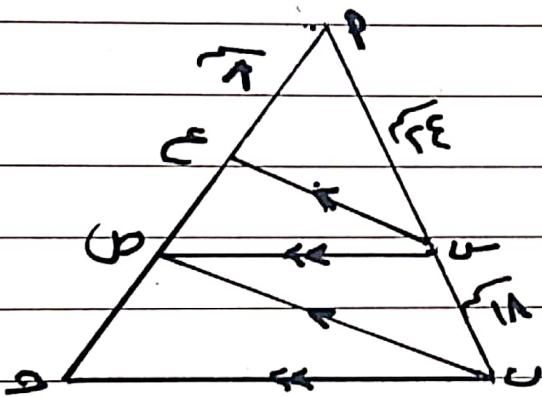


(٢١) في الشكل المقابل
 $PA = 8$ و $PB = 10$ و $PC = 4$ و $PD = 6$
 فانه $AC = \dots = \dots$

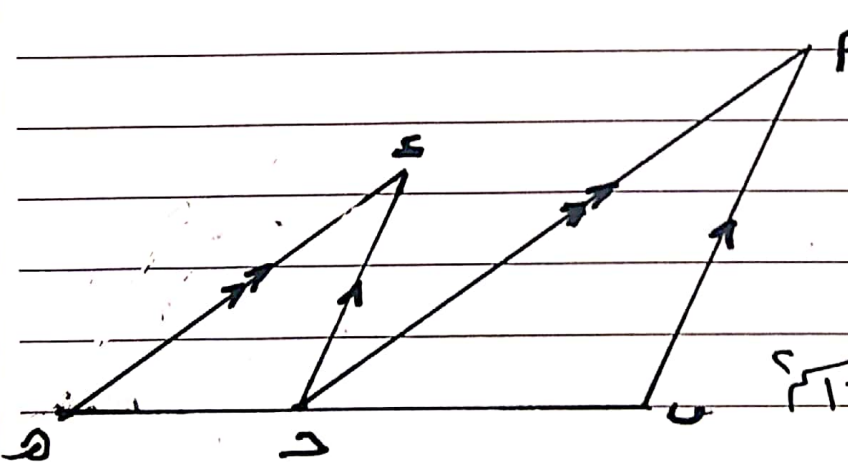
(٢١) إذا رسم مستقيم يوازي أحد أضلاع مثلث ويقطع الضلعين الآخرين فإنه يقسمهما إلى

(٢٢) إذا قطع مستقيم ضلعين من أضلاع مثلث وقسمهما إلى قطع أطوالها متناسبة فإنه

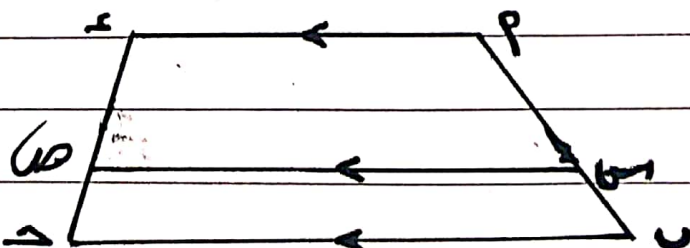
(٢٣) إذا قطع مستقيم عدة مستقيمت متوازية فإنه أطوال القطع الناتجة على



(٢٤) في الشكل المقابل
 $\overline{ST} \parallel \overline{UV}$ و $\overline{SU} \parallel \overline{TV}$
 $ST = UV$ و $SU = TV$
 $ST = UV$
 أوجد طول كل من \overline{SU} و \overline{TV}



(٢٥) في الشكل المقابل
 $\overline{ST} \parallel \overline{UV}$
 $\overline{SU} \parallel \overline{TV}$
 $ST = UV$
 أوجد مساحة $\triangle PQR$
 علماً بأنه $(\triangle PQR) = 16$ كم^٢

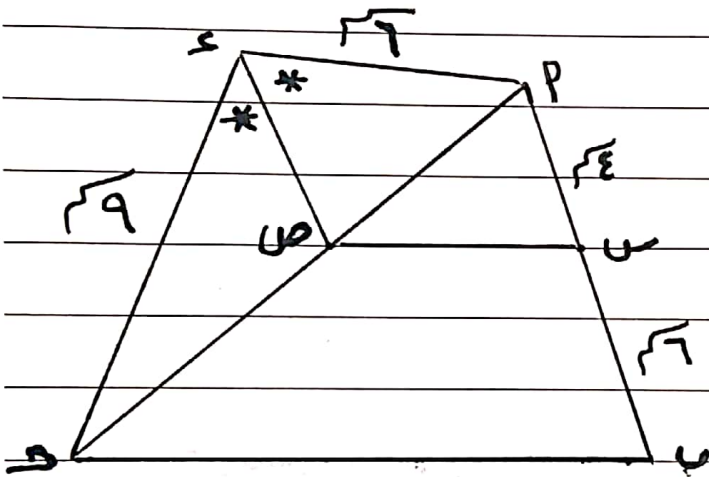


(٢٦) في الشكل المقابل
 $\overline{ST} \parallel \overline{UV}$
 $\overline{SU} \parallel \overline{TV}$
 فإنه $\frac{ST}{UV} = \frac{SU}{TV}$

(٢٧) المنصفان الداخلي والخارجي لزاوية رأس مثلث

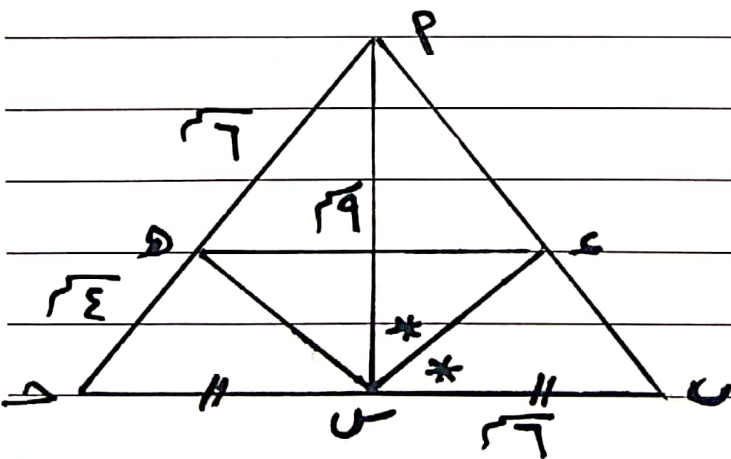
(٢٨) المنصف الخارجي لزاوية رأس المثلث المتساوي
الساقيين قاعدة المثلث

(٢٩) إذا كانت م نقطة خارج دائرة وكان م ج مماساً
لها عند د س يمر بقطع الدائرة في م د س
فإنه (م د) = (م س)



(٣٠) في الشكل المقابل

$\angle A = \angle B = \angle C$
 $\angle D = \angle E$
 $\angle ADE = \angle AED$
 AD ينصف $\angle A$
 أثبت أن: $\overline{AD} \parallel \overline{DE}$



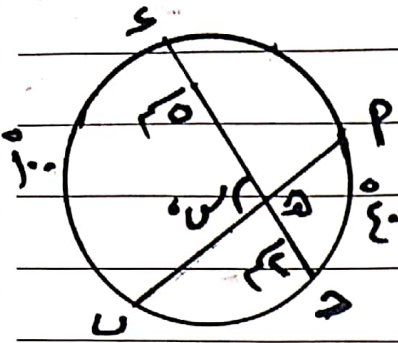
(٣١) في الشكل المقابل

س منتصف \overline{BC}
 \overline{AS} ينصف $\angle A$
 $\angle A = \angle B = \angle C$
 $\angle D = \angle E$
 $\angle ADE = \angle AED$

أولاً: اوجد قيمة $\frac{\angle P}{\angle A}$

ثانياً: أثبت أن $\overline{AS} \parallel \overline{DE}$

ثالثاً: أثبت أن \overline{AS} ينصف $\angle A$



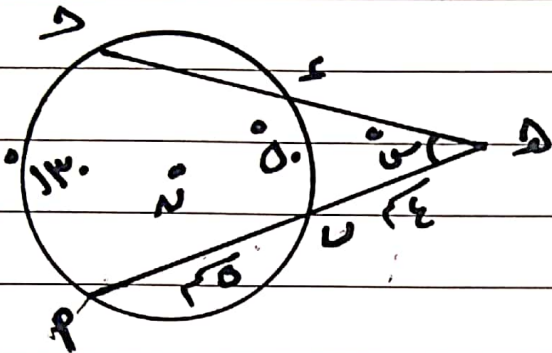
(٤٤) في الشكل المقابل: دائرة م فيها

$$\angle AOP = 40^\circ$$

$$\angle BOP = 140^\circ$$

$$\angle APB = ?$$

$$\text{والمطلوب} = (5)$$

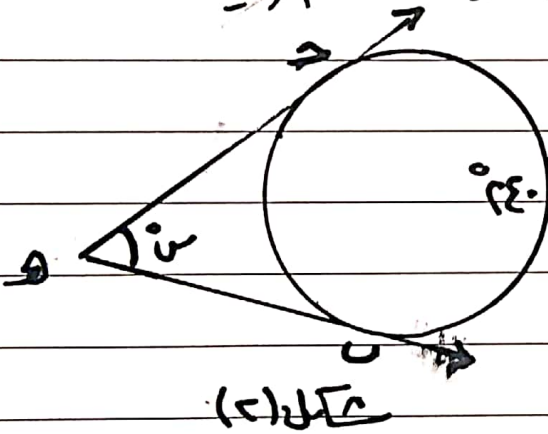


(٤٥) في الشكل المقابل:

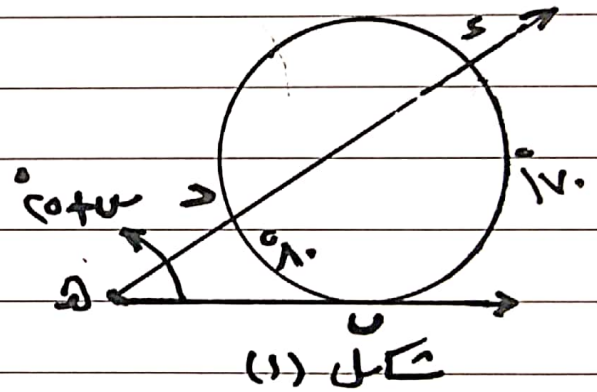
$$\angle AOP = 40^\circ$$

$$\angle BOP = 140^\circ$$

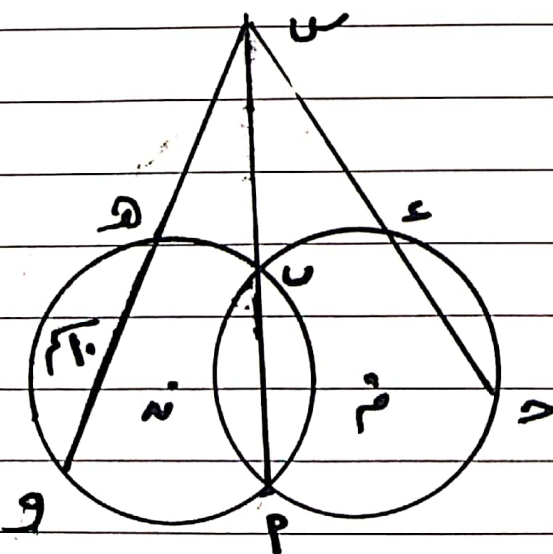
(٤٦) اوجد قيمة من العودية في الاشكال الآتية



شكل (٢)



شكل (١)



(٤٧) في الشكل المقابل:

م، ن دائرتان متقاطعتان

في م، ن ك، س = س، ع = ع، د

$$\angle APO_1 = 40^\circ$$

(١) أثبت أن $\angle APB$ محور اساس للدائرتين

(٢) اوجد طول $\angle APB$

(٣) اثبت أن $\angle APB$ وربعها رايزي

في الاجابة في

11) ا (ب) يتشابهان (ج) لا يتغير (د) $\frac{9}{20}$ (هـ) $\frac{9}{20}$

(5) ب: $\frac{1}{2} = \frac{2}{4}$ $\frac{2}{4} = \frac{4}{8}$ $\frac{4}{8} = \frac{8}{16}$ $\frac{8}{16} = \frac{16}{32}$ $\frac{16}{32} = \frac{32}{64}$ $\frac{32}{64} = \frac{64}{128}$ $\frac{64}{128} = \frac{128}{256}$ $\frac{128}{256} = \frac{256}{512}$ $\frac{256}{512} = \frac{512}{1024}$ $\frac{512}{1024} = \frac{1024}{2048}$ $\frac{1024}{2048} = \frac{2048}{4096}$ $\frac{2048}{4096} = \frac{4096}{8192}$ $\frac{4096}{8192} = \frac{8192}{16384}$ $\frac{8192}{16384} = \frac{16384}{32768}$ $\frac{16384}{32768} = \frac{32768}{65536}$ $\frac{32768}{65536} = \frac{65536}{131072}$ $\frac{65536}{131072} = \frac{131072}{262144}$ $\frac{131072}{262144} = \frac{262144}{524288}$ $\frac{262144}{524288} = \frac{524288}{1048576}$ $\frac{524288}{1048576} = \frac{1048576}{2097152}$ $\frac{1048576}{2097152} = \frac{2097152}{4194304}$ $\frac{2097152}{4194304} = \frac{4194304}{8388608}$ $\frac{4194304}{8388608} = \frac{8388608}{16777216}$ $\frac{8388608}{16777216} = \frac{16777216}{33554432}$ $\frac{16777216}{33554432} = \frac{33554432}{67108864}$ $\frac{33554432}{67108864} = \frac{67108864}{134217728}$ $\frac{67108864}{134217728} = \frac{134217728}{268435456}$ $\frac{134217728}{268435456} = \frac{268435456}{536870912}$ $\frac{268435456}{536870912} = \frac{536870912}{1073741824}$ $\frac{536870912}{1073741824} = \frac{1073741824}{2147483648}$ $\frac{1073741824}{2147483648} = \frac{2147483648}{4294967296}$ $\frac{2147483648}{4294967296} = \frac{4294967296}{8589934592}$ $\frac{4294967296}{8589934592} = \frac{8589934592}{17179869184}$ $\frac{8589934592}{17179869184} = \frac{17179869184}{34359738368}$ $\frac{17179869184}{34359738368} = \frac{34359738368}{68719476736}$ $\frac{34359738368}{68719476736} = \frac{68719476736}{137438953472}$ $\frac{68719476736}{137438953472} = \frac{137438953472}{274877906944}$ $\frac{137438953472}{274877906944} = \frac{274877906944}{549755813888}$ $\frac{274877906944}{549755813888} = \frac{549755813888}{1099511627776}$ 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\frac{154742504910672534362390528}{309485009821345068724781056}$ $\frac{154742504910672534362390528}{309485009821345068724781056} = \frac{309485009821345068724781056}{618970019642690137449562112}$ $\frac{309485009821345068724781056}{618970019642690137449562112} = \frac{618970019642690137449562112}{1237940039285380274899124224}$ $\frac{618970019642690137449562112}{1237940039285380274899124224} = \frac{1237940039285380274899124224}{2475880078570760549798248448}$ $\frac{1237940039285380274899124224}{2475880078570760549798248448} = \frac{2475880078570760549798248448}{4951760157141521099596496896}$ $\frac{2475880078570760549798248448}{4951760157141521099596496896} = \frac{4951760157141521099596496896}{9903520314283042199192993792}$ $\frac{4951760157141521099596496896}{9903520314283042199192993792} = \frac{9903520314283042199192993792}{19807040628566084398385987584}$ $\frac{9903520314283042199192993792}{19807040628566084398385987584} = \frac{19807040628566084398385987584}{39614081257132168796771975168}$ $\frac{19807040628566084398385987584}{39614081257132168796771975168} = \frac{39614081257132168796771975168}{79228162514264337593543950336}$ $\frac{39614081257132168796771975168}{79228162514264337593543950336} = \frac{79228162514264337593543950336}{158456325028528675187087900672}$ $\frac{79228162514264337593543950336}{158456325028528675187087900672} = \frac{158456325028528675187087900672}{316912650057057350374175801344}$ $\frac{158456325028528675187087900672}{316912650057057350374175801344} = \frac{316912650057057350374175801344}{633825300114114700748351602688}$ $\frac{316912650057057350374175801344}{633825300114114700748351602688} = \frac{633825300114114700748351602688}{1267650600228229401496703205376}$ $\frac{633825300114114700748351602688}{1267650600228229401496703205376} = \frac{1267650600228229401496703205376}{2535301200456458802993406410752}$ $\frac{1267650600228229401496703205376}{2535301200456458802993406410752} = \frac{2535301200456458802993406410752}{5070602400912917605986812821504}$ $\frac{2535301200456458802993406410752}{5070602400912917605986812821504} = \frac{5070602400912917605986812821504}{10141204801825835211973625643008}$ $\frac{5070602400912917605986812821504}{10141204801825835211973625643008} = \frac{10141204801825835211973625643008}{20282409603651670423947251286016}$ $\frac{10141204801825835211973625643008}{20282409603651670423947251286016} = \frac{20282409603651670423947251286016}{40564819207303340847894502572032}$ $\frac{20282409603651670423947251286016}{40564819207303340847894502572032} = \frac{40564819207303340847894502572032}{81129638414606681695789005144064}$ $\frac{40564819207303340847894502572032}{81129638414606681695789005144064} = \frac{81129638414606681695789005144064}{162259276829213363391578010288128}$ $\frac{81129638414606681695789005144064}{162259276829213363391578010288128} = \frac{162259276829213363391578010288128}{324518553658426726783156020576256}$ $\frac{162259276829213363391578010288128}{324518553658426726783156020576256} = \frac{324518553658426726783156020576256}{649037107316853453566312041152512}$ $\frac{324518553658426726783156020576256}{649037107316853453566312041152512} = \frac{649037107316853453566312041152512}{1298074214633706907132624082305024}$ $\frac{649037107316853453566312041152512}{1298074214633706907132624082305024} = \frac{1298074214633706907132624082305024}{2596148429267413814265248164610048}$ $\frac{1298074214633706907132624082305024}{2596148429267413814265248164610048} = \frac{2596148429267413814265248164610048}{5192296858534827628530496329220096}$ $\frac{2596148429267413814265248164610048}{5192296858534827628530496329220096} = \frac{5192296858534827628530496329220096}{10384593717069655257060992658440192}$ $\frac{5192296858534827628530496329220096}{10384593717069655257060992658440192} = \frac{10384593717069655257060992658440192}{20769187434139310514121985316880384}$ $\frac{10384593717069655257060992658440192}{20769187434139310514121985316880384} = \frac{20769187434139310514121985316880384}{41538374868278621028243970633760768}$ $\frac{20769187434139310514121985316880384}{41538374868278621028243970633760768} = \frac{41538374868278621028243970633760768}{83076749736557242056487941267521536}$ $\frac{41538374868278621028243970633760768}{83076749736557242056487941267521536} = \frac{83076749736557242056487941267521536}{166153499473114484112975882535043072}$ $\frac{83076749736557242056487941267521536}{166153499473114484112975882535043072} = \frac{166153499473114484112975882535043072}{332306998946228968225951765070086144}$ $\frac{166153499473114484112975882535043072}{332306998946228968225951765070086144} = \frac{332306998946228968225951765070086144}{664613997892457936451903530140172288}$ $\frac{332306998946228968225951765070086144}{664613997892457936451903530140172288} = \frac{664613997892457936451903530140172288}{1329227995784915872903807060280344576}$ $\frac{664613997892457936451903530140172288}{1329227995784915872903807060280344576} = \frac{1329227995784915872903807060280344576}{2658455991569831745807614120560689152}$ $\frac{1329227995784915872903807060280344576}{2658455991569831745807614120560689152} = \frac{2658455991569831745807614120560689152}{5316911983139663491615228241121378304}$ $\frac{2658455991569831745807614120560689152}{5316911983139663491615228241121378304} = \frac{5316911983139663491615228241121378304}{10633823966279326983230456482242756608}$ $\frac{5316911983139663491615228241121378304}{10633823966279326983230456482242756608} = \frac{10633823966279326983230456482242756608}{21267647932558653966460912964485513216}$ $\frac{10633823966279326983230456482242756608}{21267647932558653966460912964485513216} = \frac{21267647932558653966460912964485513216}{42535295865117307932921825928971026432}$ $\frac{21267647932558653966460912964485513216}{42535295865117307932921825928971026432} = \frac{42535295865117307932921825928971026432}{85070591730234615865843651857942052864}$ $\frac{42535295865117307932921825928971026432}{85070591730234615865843651857942052864} = \frac{85070591730234615865843651857942052864}{170141183460469231731687303715884105728}$ $\frac{85070591730234615865843651857942052864}{170141183460469231731687303715884105728} = \frac{170141183460469231731687303715884105728}{340282366920938463463374607431768211456}$ $\frac{170141183460469231731687303715884105728}{340282366920938463463374607431768211456} = \frac{340282366920938463463374607431768211456}{680564733841876926926749214863536422912}$ $\frac{340282366920938463463374607431768211456}{6805647338$

$$(11) \quad \frac{1}{6} = \frac{9}{54} \quad \therefore \frac{1}{6} = \frac{9}{54} \quad \therefore \frac{1}{6} = \frac{9}{54}$$

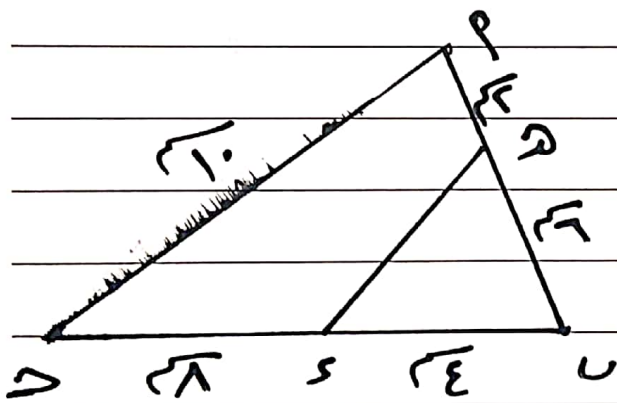
$$(12) \quad \text{مساحة المستطيل الأول} = 12 \times 8 = 96 \text{ سم}^2$$

$$\frac{1}{5} = \frac{8}{40} = \frac{12}{60} = \frac{16}{80}$$

$$\frac{1}{5} = \frac{8}{40} \quad \text{منها عرض المستطيل الثاني} = 8 \text{ سم}$$

$$\frac{1}{5} = \frac{12}{60} \quad \text{منها طول المستطيل الثاني} = 12 \text{ سم}$$

$$\text{مساحة المستطيل الثاني} = 8 \times 12 = 96 \text{ سم}^2$$



(13) (14) $\triangle PQR \sim \triangle PQR$
فيها

$$(1) \quad \text{مشاركة} \quad \frac{1}{2} = \frac{4}{8} = \frac{5}{10}$$

$$\frac{1}{2} = \frac{6}{12} = \frac{5}{10}$$

$$\frac{5}{10} = \frac{5}{10}$$

منه $\triangle PQR \sim \triangle PQR$ نتيجة أنه $\triangle PQR \sim \triangle PQR$

$$(15) \quad \triangle PQR \sim \triangle PQR \quad \therefore \frac{5}{10} = \frac{5}{10} = \frac{5}{10}$$

$$\frac{6}{12} = \frac{5}{10} = \frac{4}{8}$$

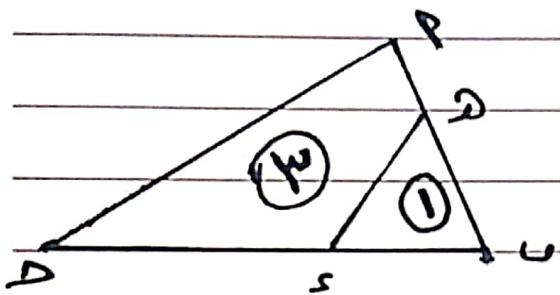
$$(16) \quad \triangle PQR \sim \triangle PQR \quad \therefore \triangle PQR \sim \triangle PQR$$

وهي زاوية خارجية للشكل الرباعي PDEH
 ∴ PDEH شكل رباعي دائري

$$(ع) ∴ \Delta PDE \sim \Delta HDE \quad ∴ \frac{PE}{DE} = \frac{PD}{HE}$$

$$\frac{PE}{DE} = \frac{PD}{HE} = \frac{1}{1} = \frac{PE}{DE}$$

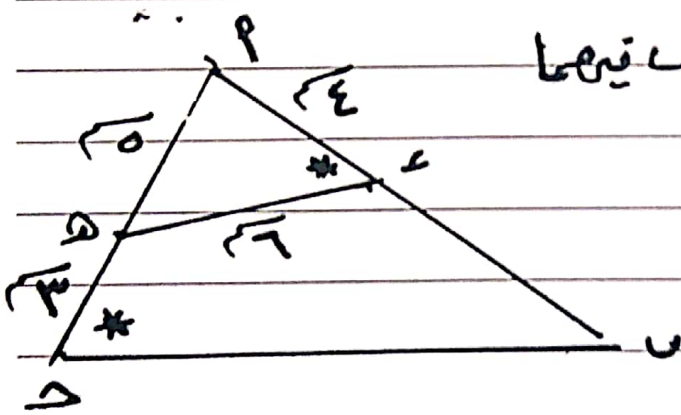
∴ PD (1) ∽ DE (2) ∽ HE (3) ∴ 1 : 2 : 3



(هـ) من الشكل نجد أنه

DE (2) ∽ HE (3) ∽ PD (1) ∴ 2 : 3 : 1

وكذلك يمكن استنتاج أنه DE (2) ∽ PD (1) ∽ HE (3) ∴ 2 : 1 : 3



(14) (P) ∴ Δ PDE ∽ Δ PHE

(11) P مشتركة

(ع) ∴ ∠ PDE = ∠ PHE

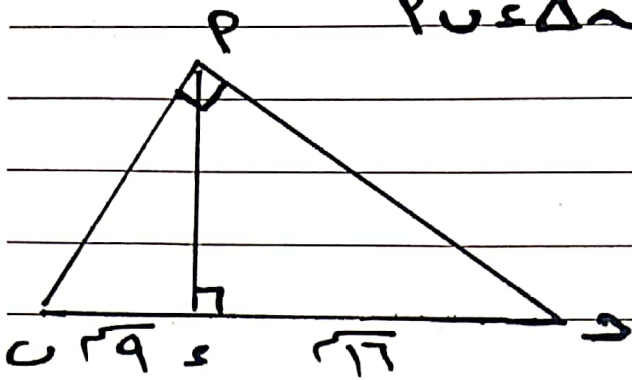
∴ ∠ PDE = ∠ PHE ∴

∴ Δ PDE ∽ Δ PHE

$$(12) من التشابه يتبع أنه $\frac{PD}{PE} = \frac{DE}{HE} = \frac{PE}{PE}$$$

$$\therefore \frac{PD}{PE} = \frac{DE}{HE} = \frac{PE}{PE} \quad \text{فمنها } PD = DE \quad \therefore PE = HE$$

(15) $\Delta P \sim \Delta P \sim \Delta P$



(a) $25 \times 9 = (P)^2$

$225 = 9 \times P$

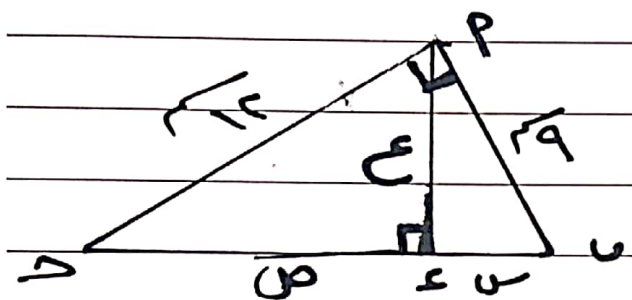
$\sqrt{25} = P$

(b) $9 \times 16 = (P)^2$

$144 = 9 \times P$

$\sqrt{144} = P$

(16) $\Delta P \sim \Delta P$ قائم الزاوية في (P)



$(9) + (16) = (P)$

$\sqrt{25} = P$

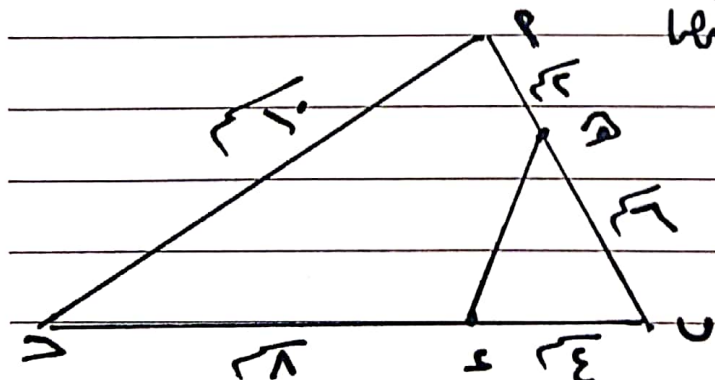
(a) $25 \times 9 = 225 = 15 \times 15$

$15 = 25 - 9 = 16$

(b) $9 \times 16 = 144 = 12 \times 12$

$12 = 9 + 16 = 25$

(17) $\Delta P \sim \Delta P$ فيها



(1) مشتركة

(a) $\frac{1}{17} = \frac{8}{10} = \frac{4}{5}$

(b) $\frac{1}{17} = \frac{12}{10} = \frac{6}{5}$

$\frac{1}{17} = \frac{10}{17} = \frac{10}{17}$

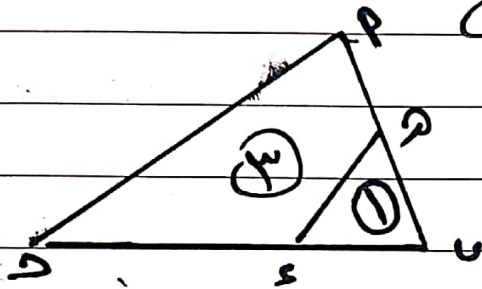
$\Delta P \sim \Delta P$

ومنه التشابه ينتج أنه $\frac{SU}{SU} = \frac{SE}{SE} = \frac{SU}{SU}$

$\therefore \frac{SE}{10} = \frac{4}{8} \therefore SE = \frac{4 \times 10}{8} = 5$

(ب) منه التشابه ينتج أنه $\angle (SDE) = \angle (SDE)$ وهي خارجية للأصل الرباعي $PSDE$

ب $PSDE$ شكل رباعي داخلي $\therefore \Delta SDE \sim \Delta SDE$

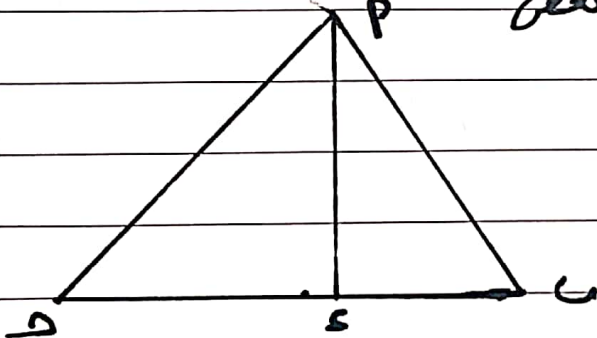


$\therefore \frac{1}{2} = \left(\frac{SE}{SU}\right) = \frac{SE}{SU}$

$\therefore SE = \frac{SU}{2} = \frac{10}{2} = 5$

(18) $\therefore SE \times SU = (SE)^2$ معطى

$\therefore SE \times SU = SE \times SE$ منها



$\therefore \frac{SU}{SE} = \frac{SE}{SE}$ ①

$\therefore \frac{SU}{SE} = \frac{SU}{SE}$ معطى منها $\Delta PSE = \Delta SEP$ ②

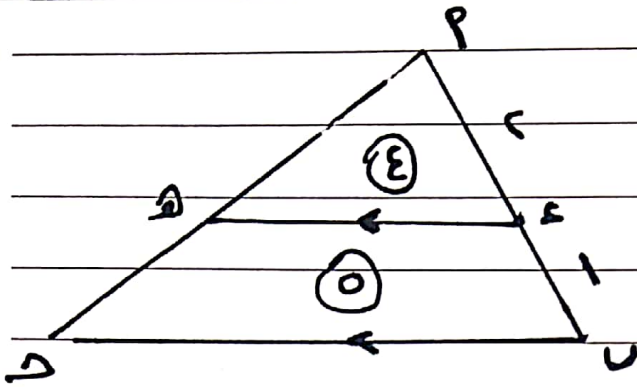
منه ① و ② ينتج

$\therefore \Delta PSE \sim \Delta SEP$ أولاً $\frac{SE}{SE} = \frac{SU}{SE} = \frac{SU}{SE}$

(ب) منه التشابه ينتج أنه $\angle (SDE) = \angle (SDE)$

وهي زاويتان متكاملتان $\therefore \angle (SDE) = \angle (SDE) = 90^\circ$

$\therefore SE \perp SD$ ثانياً



(19) $\overline{DU} \parallel \overline{HE}$

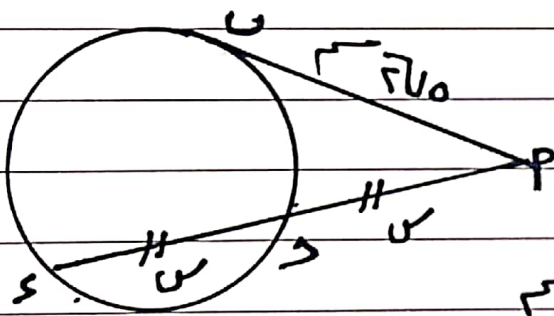
$\triangle DPU \sim \triangle HPE$

$\left(\frac{PE}{PU}\right) = \left(\frac{HP}{PD}\right) = \frac{HE}{DU}$

$\frac{2}{9} = \frac{HE}{DU}$

$\frac{2}{5} = \frac{HE}{DU}$ (شبه المنزلة هـ د هـ)

$\frac{2}{5} = \frac{6}{DU}$ (شبه المنزلة هـ د هـ)
 \therefore ما هو شبه المنزلة = $\frac{6 \times 5}{2} = 15$ كم



(20) $PU \times PD = (PV)^2$

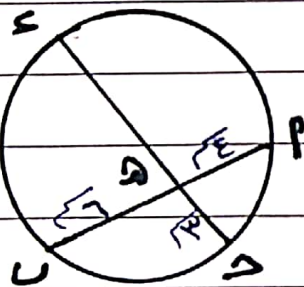
$PH \times PS =$

$(PV)^2$

$PH \times PS = PV^2$

$PH \times OS = PV^2$

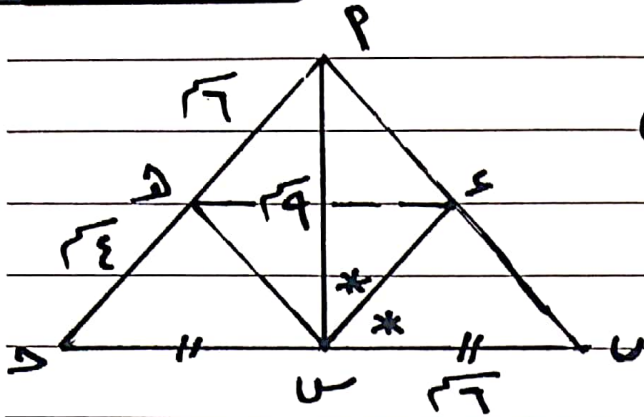
$PH \times OS = PD^2$



(21) $PA \times PD = PB \times PE$

$3 \times 6 = PA \times 4$

$PA = 4.5$



(31) من مستقيم \overline{EF}

∴ $PE = EQ = PF = FR$ ← ①

∴ ΔPEF من مستقيم

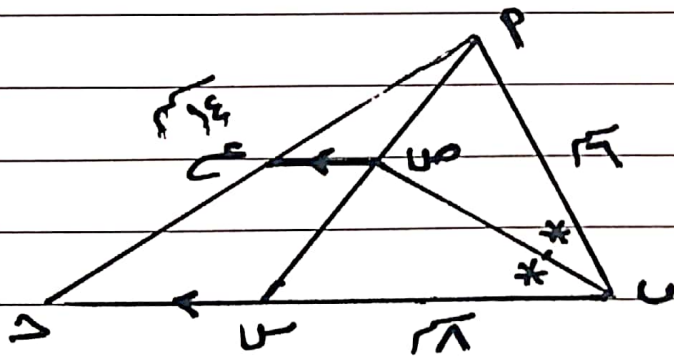
من \overline{EF} ينصف ΔPQR

∴ $\frac{PE}{EQ} = \frac{PF}{FR}$

∴ $\frac{3}{2} = \frac{9}{6} = \frac{EP}{EQ}$ ← أولاً

* ثانياً: ∴ ΔPEF من مستقيم فيه $\frac{3}{2} = \frac{EP}{EQ}$ ∴ $\frac{EP}{EQ} = \frac{EP}{EQ}$ ← ∴ $\frac{EP}{EQ} = \frac{EP}{EQ}$

* ثالثاً: ∴ ΔPEF من مستقيم فيه $\frac{3}{2} = \frac{EP}{EQ}$ ∴ $\frac{EP}{EQ} = \frac{EP}{EQ}$ ← ∴ $\frac{EP}{EQ} = \frac{EP}{EQ}$



(32) $PE = EQ$ من مستقيم

من ΔPQR

من \overline{EF} ينصف ΔPQR

∴ $\frac{PE}{EQ} = \frac{PF}{FR}$ ← ①

∴ ΔPEF من مستقيم فيه $\overline{EF} \parallel \overline{QR}$

∴ $\frac{EP}{EQ} = \frac{EP}{EQ}$ ← ②

∴ $\frac{EP}{EQ} = \frac{EP}{EQ}$ ← أولاً

∴ $PE = EQ$ ∴ $PE = EQ$ ∴ $PE = EQ$

∴ $\frac{EP}{EQ} = \frac{EP}{EQ}$ ∴ $\frac{EP}{EQ} = \frac{EP}{EQ}$

∴ $PE = EQ$ ∴ $PE = EQ$

∴ $PE = EQ$ ∴ $PE = EQ$

بالمثل : $\frac{ص}{ص} = \frac{ع}{ع} = \frac{ح}{ح} \leftarrow \therefore م = ص = ح$ $\frac{ص}{ص} = \frac{ع}{ع} = \frac{ح}{ح}$ $\frac{ص}{ص} = \frac{ع}{ع} = \frac{ح}{ح}$

$\therefore م = ص = ح$ $\therefore م = ص = ح$ $\therefore م = ص = ح$

(٣٣) $\frac{ص}{ص} = \frac{ع}{ع} = \frac{ح}{ح}$ $\frac{ص}{ص} = \frac{ع}{ع} = \frac{ح}{ح}$ $\frac{ص}{ص} = \frac{ع}{ع} = \frac{ح}{ح}$

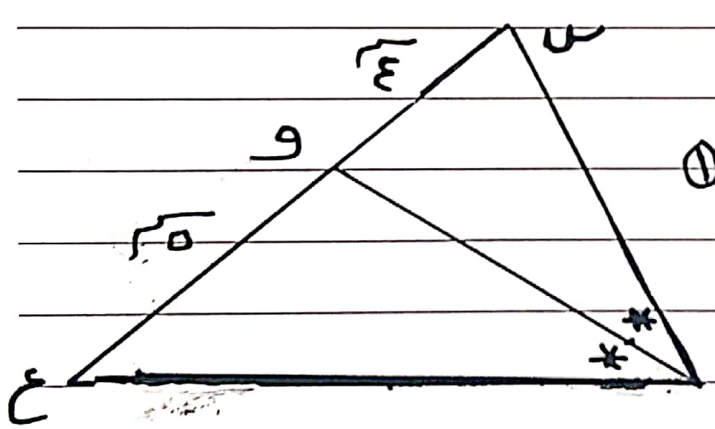
بالتعويض من ⑤ في ①

$\therefore م = ٥ \times \frac{٤}{٥} = ٤$ $\frac{٥}{٥} = ٦ \times \frac{٥}{٥} = ٦$

$\therefore م = ٦ \times \frac{٥}{٥} = ٦$

$١٥ = ٣ \times ٥ = ٤ \times ٥$

$\therefore م = ٦$ $\therefore م = ٦$ $\therefore م = ٦$



(٣٤) \therefore قِطْعَةُ $ص$ $ص = ع$

$\therefore م = ص + ع + ح = ٩ + ٥ + ٥$

$\therefore م = ١٨$

Δ $ص$ $ص$ $ع$ فيه

\leftarrow $ص$ \rightarrow $ص$

$\frac{ع}{٥} = \frac{ص}{ص}$

$\frac{ص}{ص} = \frac{ع}{ع}$

$\therefore م = ٥$ $\therefore م = ٥$

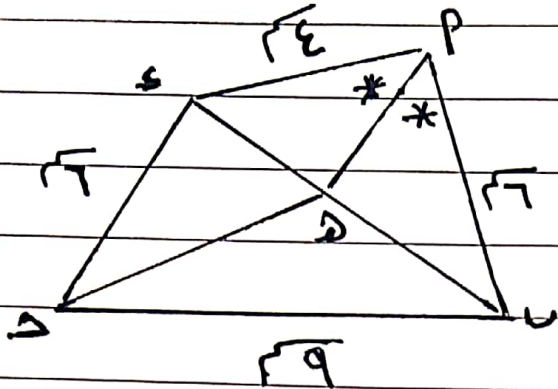
$\therefore م = ٩$ $\therefore م = ٩$ $\therefore م = ٩$

$\therefore م = ٨$

$\therefore م = ١٠$

(٣٥) $\Delta P U \epsilon$ فيه

$\overline{P \epsilon}$ ينصف $\overline{P U}$



$$\frac{7}{\epsilon} = \frac{P U}{\epsilon P} = \frac{5 U}{\epsilon \epsilon}$$

$$\textcircled{1} \leftarrow \frac{3}{\epsilon} = \frac{5 U}{\epsilon \epsilon}$$

$$\textcircled{2} \leftarrow \frac{3}{\epsilon} = \frac{9}{7} = \frac{5 U}{\epsilon \epsilon}$$

منه $\textcircled{1}$ و $\textcircled{2}$ ينتج $\Delta \epsilon U \epsilon$ فيه

$$\Delta \epsilon U \epsilon \text{ ينصف } \overline{P U} \leftarrow \frac{3}{\epsilon} = \frac{5 U}{\epsilon \epsilon} = \frac{5 U}{\epsilon \epsilon}$$

(٣٦) بفرض $\overline{P U} = \overline{P \epsilon} = \overline{U \epsilon}$ سم

$$\overline{U \epsilon} \times \overline{P \epsilon} = \overline{\epsilon \epsilon} \times \overline{P U}$$

$$\overline{U \epsilon} \times \overline{U \epsilon} = \overline{\epsilon \epsilon} \times \overline{\epsilon \epsilon}$$

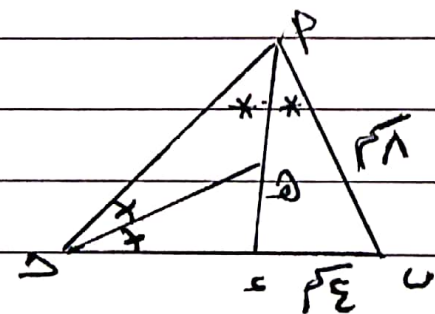
$$\overline{U \epsilon} = \overline{\epsilon \epsilon} \text{ هنا } \overline{U \epsilon} = \overline{\epsilon \epsilon}$$

بمعنى ما س للدائرة

$$\overline{P \epsilon} \times \overline{U \epsilon} = \overline{\epsilon \epsilon}^2$$

$$\overline{\epsilon \epsilon} = \overline{\epsilon \epsilon} \times \overline{\epsilon \epsilon} = \overline{\epsilon \epsilon}^2 \text{ (مربع) } \rightarrow \overline{U \epsilon} \times \overline{U \epsilon} = \overline{\epsilon \epsilon}^2$$

$$\overline{U \epsilon} = \overline{\epsilon \epsilon} = \sqrt{\overline{\epsilon \epsilon}^2} \text{ سم}$$



$$\textcircled{1} \leftarrow \frac{\overline{P U}}{\overline{\epsilon \epsilon}} = \frac{\overline{P \epsilon}}{\overline{\epsilon \epsilon}} \text{ (٣٧)}$$

$$\frac{1}{\overline{P \epsilon}} = \frac{\epsilon}{\overline{\epsilon \epsilon}} \text{ : } \frac{\overline{P U}}{\overline{P \epsilon}} = \frac{\epsilon U}{\overline{\epsilon \epsilon}}$$

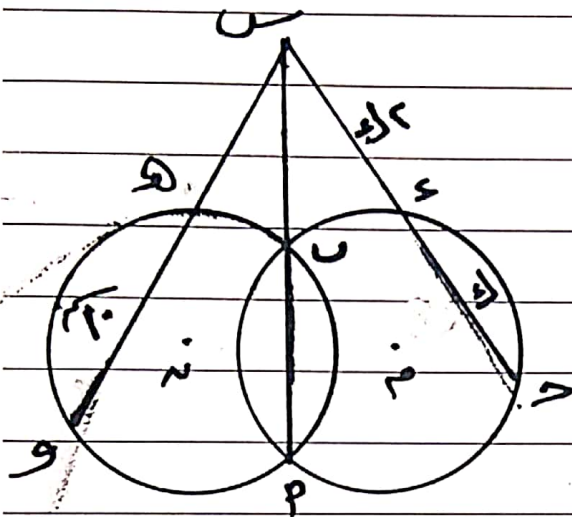
$$\text{ : } \frac{1}{\overline{\epsilon \epsilon}} = \frac{\overline{P U}}{\overline{\epsilon \epsilon}} \text{ : } \frac{1}{\overline{\epsilon \epsilon}} = \frac{\overline{P U}}{\overline{\epsilon \epsilon}} \text{ بالتعويض } \textcircled{1} \text{ : } \frac{1}{\overline{\epsilon \epsilon}} = \frac{\overline{P U}}{\overline{\epsilon \epsilon}}$$

(٤٦) شكل (١١) $\therefore \sin 40^\circ = \frac{17}{100}$

$\therefore \sin 40^\circ = 17$ منها $\sin 20^\circ = 8.5$

شكل (١٢) $\therefore \widehat{A} = 36^\circ - 24^\circ = 12^\circ$

$\therefore \sin 6^\circ = \frac{1}{2} [12^\circ - 24^\circ] = 6$



(٤٧) $\therefore P \in$ الدائرة م $\Rightarrow P \in$ الدائرة N

$\therefore \widehat{P} = \widehat{P} = \widehat{P} = \widehat{P}$

$\therefore P \in$ المحور الاساسي \leftarrow ①

بالمثل $U \in$ الدائرة م $\Rightarrow U \in$ الدائرة N

$\therefore \widehat{U} = \widehat{U} = \widehat{U} = \widehat{U}$

$\therefore U \in$ المحور الاساسي \leftarrow ②

منه ① و ② \Rightarrow يتبع أن

$P \in$ المحور الاساسي

$\therefore \vec{P} \leftarrow$ محور اساسي للدائرتين م و N \leftarrow أولاً

(٤٨) $\therefore \sin 40^\circ = \widehat{P} = \widehat{P} = \widehat{P} = \widehat{P}$

$\therefore \sin 40^\circ = 144$ $\therefore \sin 40^\circ = 144$ \leftarrow ①

بمعنى $\sin 40^\circ = 144$ $\therefore \sin 40^\circ = 144$

بالتعويض في ① $\therefore \sin 40^\circ = 144$ منها $\sin 20^\circ = 72$

$\therefore \sin 20^\circ = 72$ سم

(ii) $\therefore \sin 40^\circ = 144$ $\therefore \sin 40^\circ = 144$

$\therefore \sin 40^\circ = 144$ $\therefore \sin 40^\circ = 144$

$\therefore \sin 40^\circ = 144$ $\therefore \sin 40^\circ = 144$ سم

(٣) $\widehat{P} = \widehat{P}$ $\therefore \sin 40^\circ = 144$

$\therefore \sin 40^\circ = 144$ $\therefore \sin 40^\circ = 144$