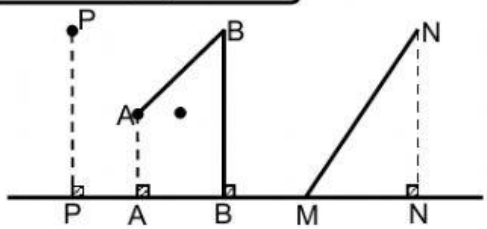
MATEMÁTICA
IV SECUNDARIA
Ficha 1: Relaciones métricas
Triángulos rectángulos

INTRODUCCIÓN

Nos damos cuenta que en nuestro entorno ciertos fenómenos están relacionados de alguna manera; la temperatura influye el cambio de estados del agua, en la sociedad todo cambio en lo político y económico está relacionado con los cambios sociales.

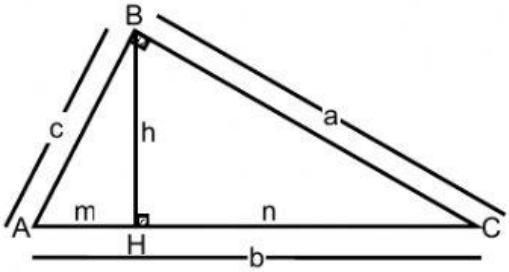
Es así, como en las figuras geométricas estudiaremos las principales relaciones entre las longitudes de las líneas que lo asocian a ellas.

PROYECCIÓN ORTOGONAL



- La proyección de P en P'
- La proyección de $\overline{AB}$ es $\overline{A'B'}$
- La proyección de $\overline{MN}$ es $\overline{MN'}$

RELACIONES MÉTRICAS EN TRIÁNGULOS RECTÁNGULOS



Elementos:

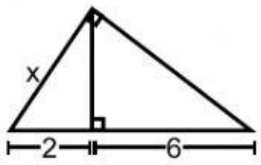
- a y c : Catetos
- b : Hipotenusa
- m : Proyección de "c"
- n : Proyección de "a"
- h : Altura

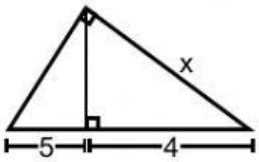
TEOREMA 1

El cuadrado de la longitud de un cateto es igual a su proyección por la hipotenusa.

$c^2 = m.\ b$ $\quad$ $a^2 = n.\ b$

Ejemplos: Calcula "x"





x =

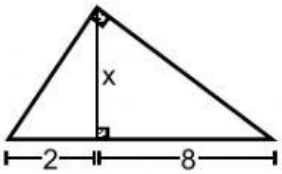
x =

TEOREMA 2

El cuadrado de la altura es igual al producto de las proyecciones de los catetos.

$h^2 = m.\ n$

Ejemplo: Calcula "x"



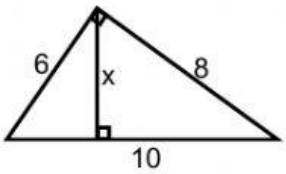
x =

TEOREMA 3

El producto de los catetos es igual al producto de la hipotenusa y la altura.

$a.\ c = b.\ h$

Ejemplo: Calcula "x"



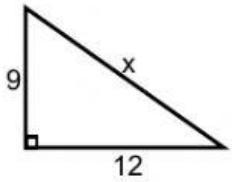
x =

TEOREMA DE PITÁGORAS

En todo triángulo rectángulo el cuadrado de la hipotenusa es igual a la suma de los cuadrados de los catetos.

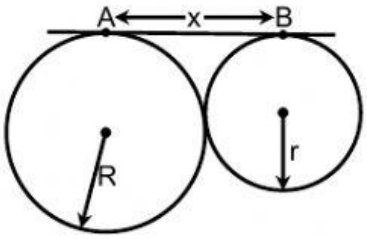
$b^2 = a^2 + c^2$

Ejemplo: Calcula "x"



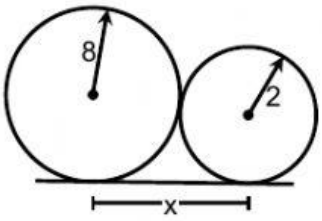
x =

CASO PARTICULAR



$x = 2\sqrt{R.r}$

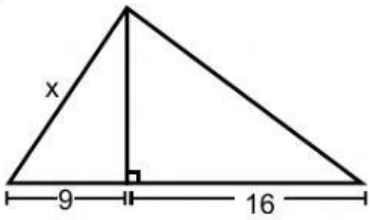
Ejemplo: Calcula "x"



x =

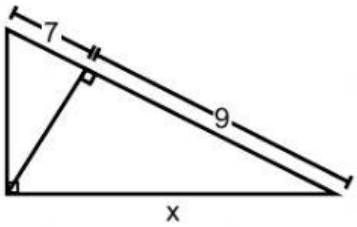
Ejercicios propuestos

1. Calcula "x"



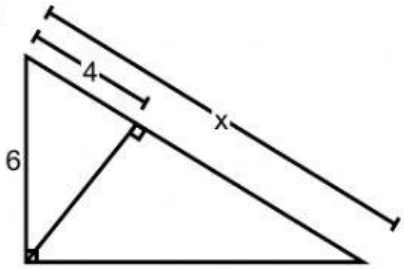
a) 12
b) 15
c) 9
d) 6
e) 18

2. Calcula "x"



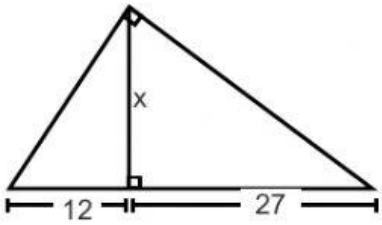
a) 12
b) $3\sqrt{7}$
c) $\sqrt{21}$
d) $9\sqrt{7}$
e) $4\sqrt{7}$

3. Calcula "x"



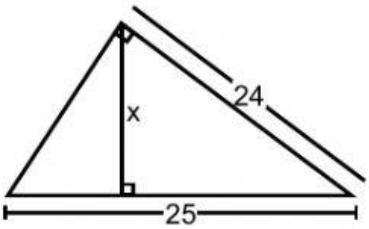
a) 9
b) 5
c) 12
d) 8
e) 7

4. Calcula "x"



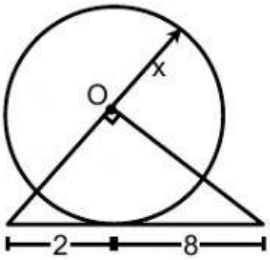
a) 36
b) 18
c) 12
d) 72
e) 24

5. Calcula "x"



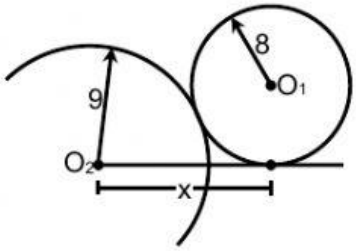
a) 24/25
b) 84/25
c) 168/25
d) 24/175
e) 84/75

6. Calcula "x"



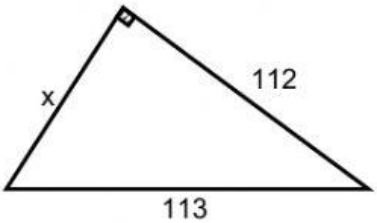
a) 8
b) 6
c) 4
d) 5
e) 7

7. Calcula "x"



a) 12
b) 13
c) 14
d) 15
e) 16

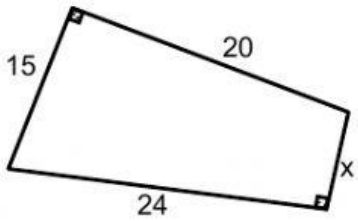
8. Calcula "x"



a) 12
b) 13
c) 14
d) 15
e) 16

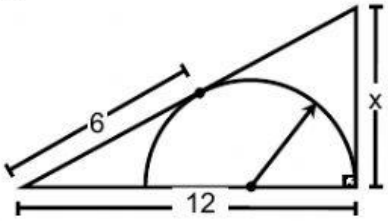
9. Calcula "x"

a) 5
b) 6
c) 7
d) 8
e) 9



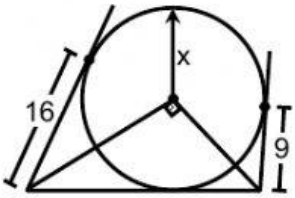
10. Calcula "x"

a) 7
b) 8
c) 9
d) 6
e) 5



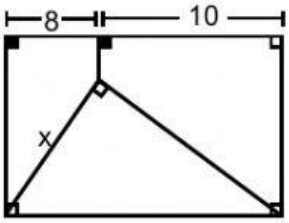
11. Calcula "x"

a) 12
b) 15
c) 7
d) $\sqrt{7}$
e) 18



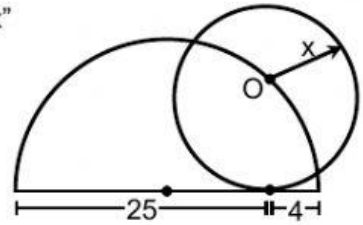
12. Calcula "x"

a) 10
b) 12
c) 15
d) 18
e) 9



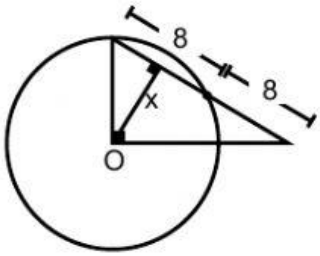
13. Calcula "x"

a) 10
b) 5
c) 8
d) 6
e) 4



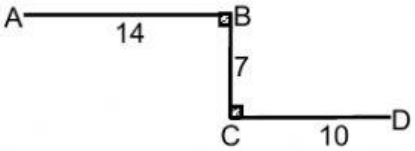
14. Calcula "x"

a) 8
b) $4\sqrt{3}$
c) 6
d) 10
e) 2



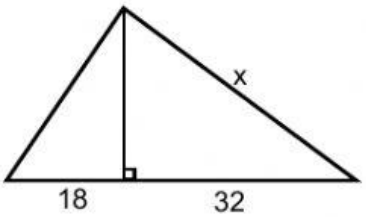
15. Calcula la distancia entre A y D

a) 31
b) 25
c) 24
d) 28
e) 30



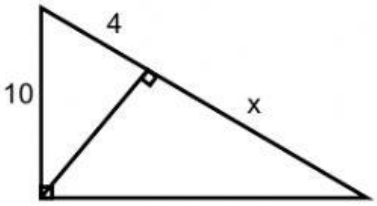
16. Calcula "x"

a) 24
b) 12
c) 36
d) 27
e) 40



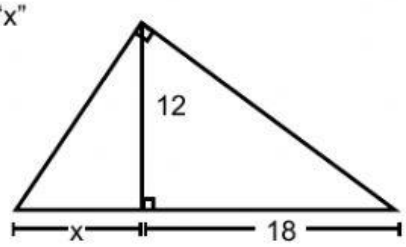
17. Calcula "x"

a) 25
b) 21
c) 33
d) 29
e) 24



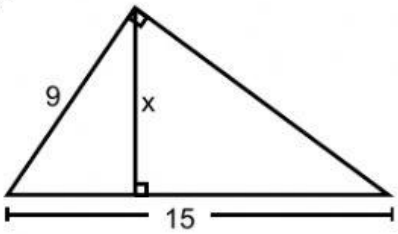
18. Calcula "x"

a) 6
b) 8
c) 10
d) 7
e) 9



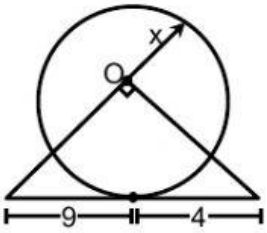
19. Calcula "x"

a) 7,2
b) 3,6
c) 4,8
d) 9,6
e) 7



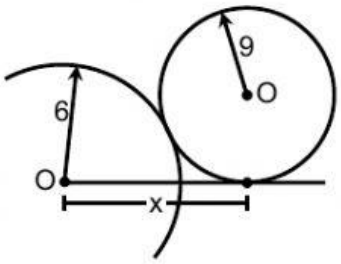
20. Calcula "x"

a) 4
b) 5
c) 6
d) 7
e) 8



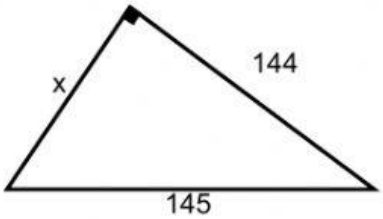
21. Calcula "x"

a) 10
b) 11
c) 12
d) 13
e) 14



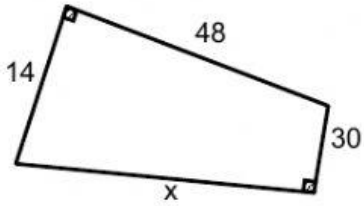
22. Calcula "x"

a) 17
b) 15
c) 13
d) 19
e) 11



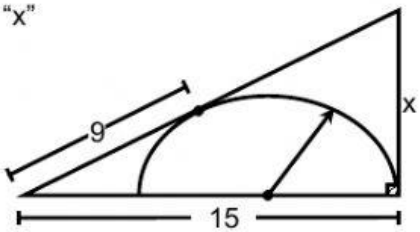
23. Calcula "x"

a) 40
b) 48
c) 45
d) 35
e) 38



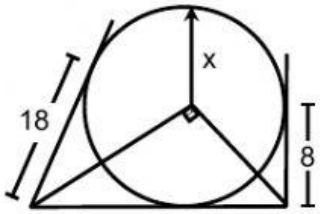
24. Calcula "x"

a) 7
b) 8
c) 6
d) 9
e) 10



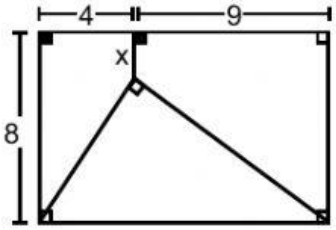
25. Calcula "x"

a) 11
b) 12
c) 13
d) 14
e) 10

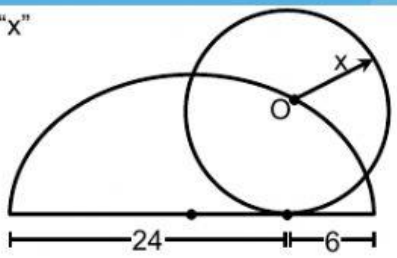


26. Calcula "x"

a) 1
b) 2
c) 3
d) 4
e) 5

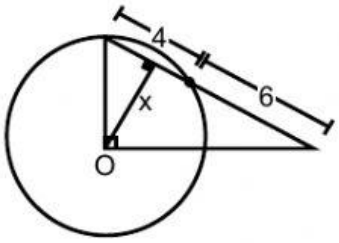


27. Calcula "x"



a) 9
b) 10
c) 11
d) 12
e) 15

28. Calcula "x"



a) 4
b) $4\sqrt{2}$
c) 6
d) 8
e) 16