Box Method
Create rectangle around shape
Subtract area of triangles from area of rectangle.

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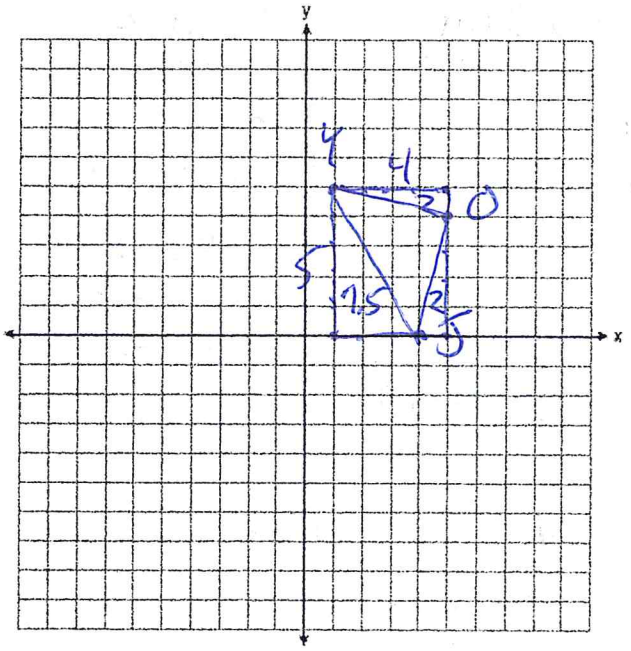
Geometry

Area with Coordinate Geometry

5. Triangle JOY has vertices J(4,0), O(5,4) and Y(1,5).
Find the area of triangle JOY.



Area rectangle = lw
Area rectangle = 4(5) = 20

Area triangle 1
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(3)(5) = 7.5$

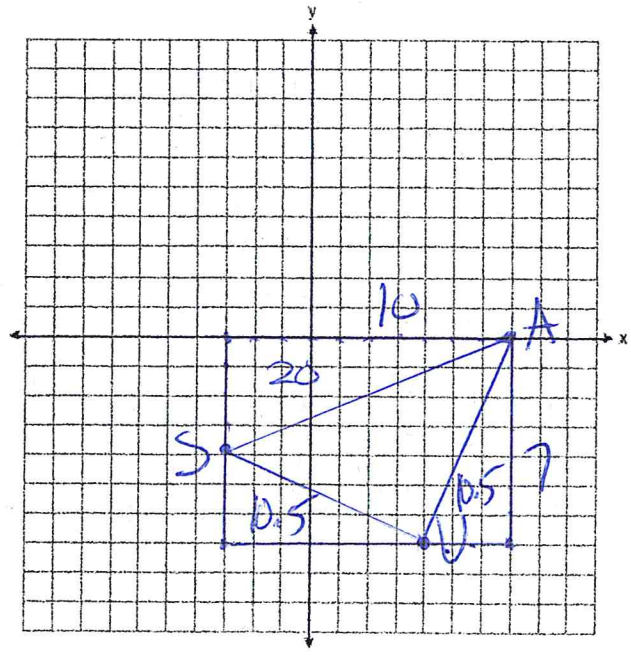
Area triangle 2
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(1)(4) = 2$

Area triangle 3
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(2)(1)$
$A = 2$

Area triangles
7.5 + 2 + 2 = 11.5

Area = $A_{rect} - A_{tris}$
Area = 20 − 11.5
Area = 8.5

6. Triangle USA has vertices U(4,-7), S(-3,-4), and A(7,0).
Find the area of triangle USA.



Area rectangle = lw
Area rectangle = 10(7) = 70

Area triangle 1
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(10)(4) = 20$

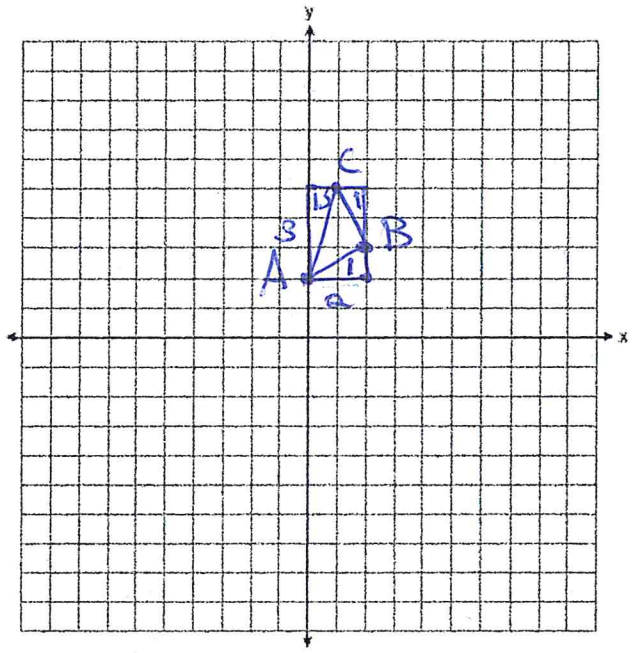
Area triangle 2
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(3)(7) = 10.5$

Area triangle 3
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(7)(3)$
$A = 10.5$

Area triangles
20 + 10.5 + 10.5 = 41

Area = $A_{rect} - A_{tris}$
Area = 70 − 41 = 29

3. Find the area of triangle ABC if A(0,2), B(2,3), and C(1,5).



Area Rectangle = lw
Area Rectangle = 2(3) = 6

Area = $A_{rect} - A_{tris}$
Area = 6 − 3.5 = 2.5

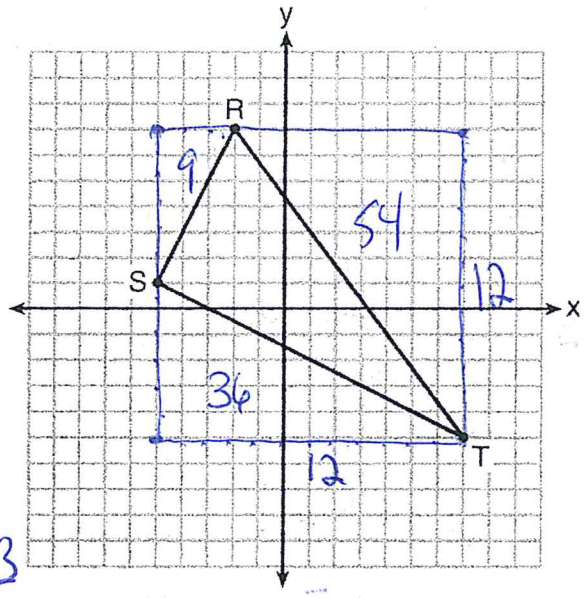
Area triangle 1
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(2)(1) = 1$

Area triangle 2
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(1)(2) = 1$

Area triangle 3
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(1)(3) = 1.5$

Area triangles
1 + 1 + 1.5 = 3.5

8. Triangle *RST* is graphed on the set of axes below.



How many square units are in the area of $\triangle RST$?

1) $9\sqrt{3} + 15$
2) $9\sqrt{5} + 15$
3) 45
4) 90

Area of rectangle = lw
Area rectangle = 12(12) = 144

Area triangle 1
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(12)(6) = 36$

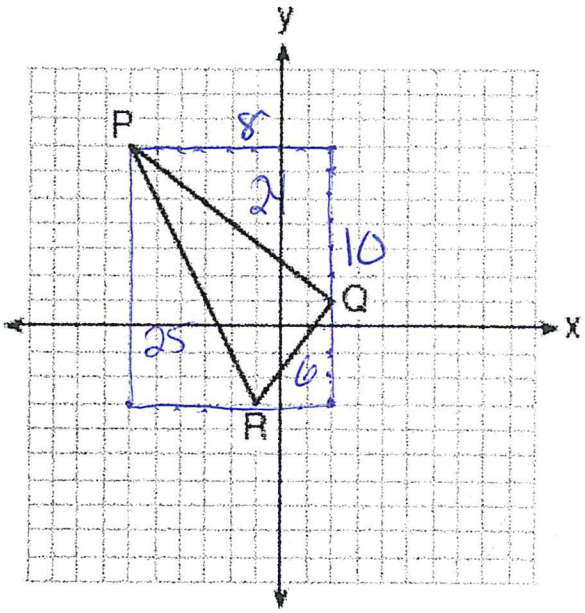
Area triangle 2
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(3)(6) = 9$

Area Triangle 3
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(9)(12) = 54$

Area Triangles
36 + 9 + 54 = 99

Area = $A_{Rect} - A_{tris}$
Area = 144 − 99 = 45

9. On the set of axes below, the vertices of $\triangle PQR$ have coordinates $P(-6, 7)$, $Q(2, 1)$, and $R(-1, -3)$.



Area rectangle = lw
Area rectangle = (8)(10) = 80

What is the area of $\triangle PQR$?

1) 10
2) 20
3) 25
4) 50

Area triangle 1
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(5)(6)$
$A = 25$

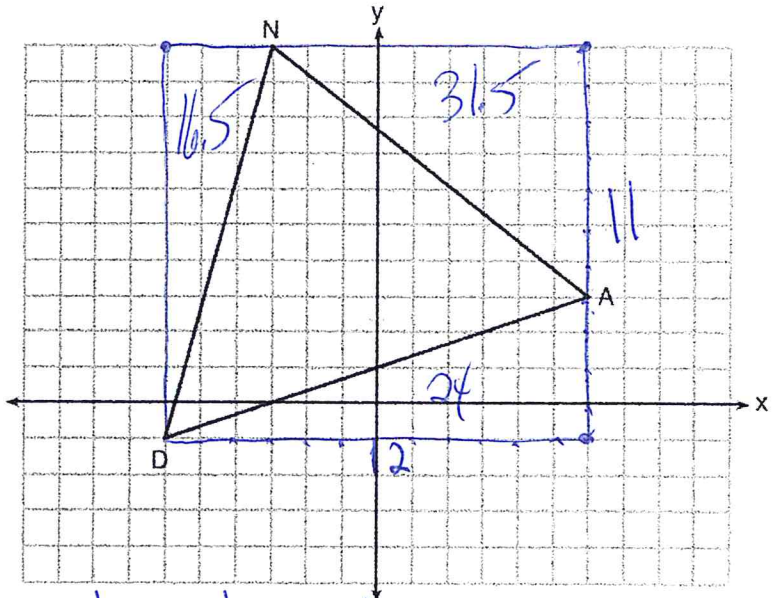
Area triangle 2
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(3)(4)$
$A = 6$

Area triangle 3
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(8)(6)$
$A = 24$

Area Triangles
25 + 6 + 24 = 55

Area = $A_{rect} - A_{tris}$
Area = 80 − 55
Area = 25

10. Triangle DAN is graphed on the set of axes below. The vertices of $\triangle DAN$ have coordinates $D(-6, -1)$, $A(6, 3)$, and $N(-3, 10)$.



What is the area of $\triangle DAN$?

1) 60
2) 120
3) $20\sqrt{13}$
4) $40\sqrt{13}$

Area rectangle = lw
Area rectangle = 12(11) = 132

Area triangle 1
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(3)(11)$
$A = 16.5$

Area triangle 2
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(9)(7)$
$A = 31.5$

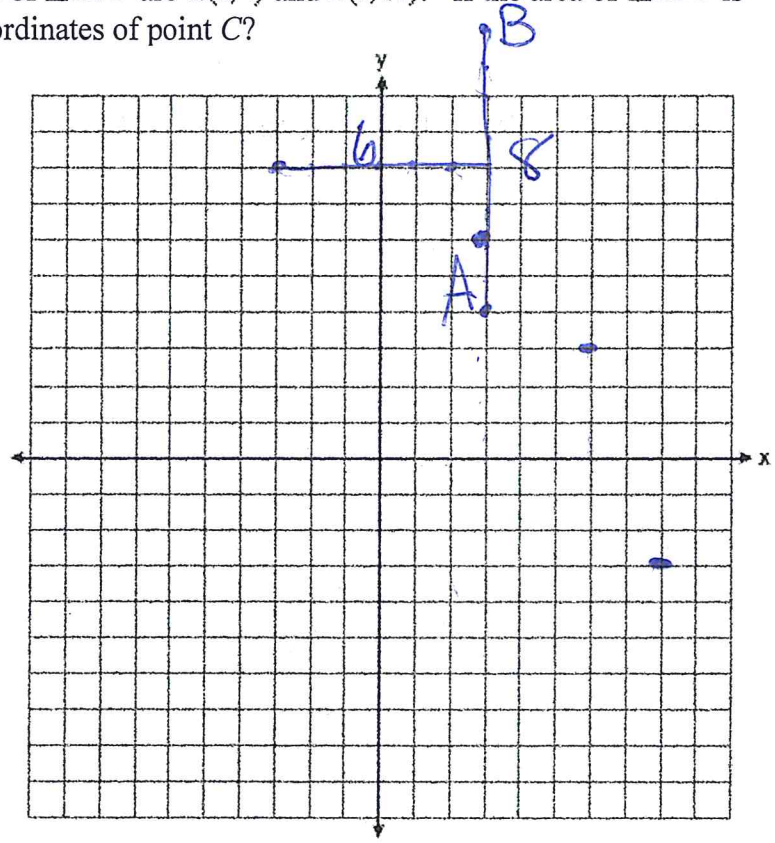
Area Triangle 3
$A = \frac{1}{2}lw$
$A = \frac{1}{2}(12)(4)$
$A = 24$

Area triangles
16.5 + 31.5 + 24
72

Area = $A_{rect} - A_{tris}$
Area = 132 − 72
Area = 60

7. The coordinates of vertices A and B of $\triangle ABC$ are $A(3,4)$ and $B(3,12)$. If the area of $\triangle ABC$ is 24 square units, what could be the coordinates of point C?

1) $(3,6)$ ✗
2) $(8,-3)$ ✗
3) $(-3,8)$ ✓
4) $(6,3)$ ✗



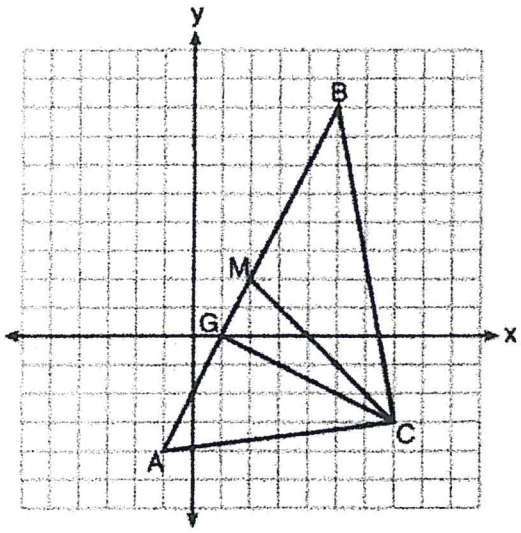
$A = \frac{1}{2}lw$

$24 = \frac{1}{2}(8)(w)$

$\frac{24}{4} = \frac{4w}{4}$

$6 = w$

8. On the set of axes below, $\triangle ABC$, altitude $\overline{CG}$, and median $\overline{CM}$ are drawn.



$A = \frac{1}{2}bh$

$b = \overline{AB}$

$h = \overline{GC}$

$A = \frac{1}{2}(\overline{AB})(\overline{GC})$

Which expression represents the area of $\triangle ABC$?

(1) $\frac{(BC)(AC)}{2}$

(2) $\frac{(GC)(BC)}{2}$

(3) $\frac{(CM)(AB)}{2}$

(4) $\frac{(GC)(AB)}{2}$