Evaluate: Homework and Practice

Personal Math Trainer
- Online Homework
- Hints and Help
- Extra Practice

Find the perimeter of the figure with the given vertices. Round to the nearest tenth.

1. $D(0, 1)$, $E(5, 4)$, and $F(2, 6)$

$DE = \sqrt{(0-5)^2+(1-4)^2} = \sqrt{34}$

$EF = \sqrt{(5-2)^2+(4-6)^2} = \sqrt{13}$

$FD = \sqrt{(2-0)^2+(6-1)^2} = \sqrt{29}$

$P = \sqrt{34} + \sqrt{13} + \sqrt{29}$

$P = 14.8$ units

2. $P(2, 5)$, $Q(-3, 0)$, $R(2, -5)$, and $S(6, 0)$

$PQ = \sqrt{(2+3)^2+5^2} = \sqrt{50} = 5\sqrt{2}$

$QR = \sqrt{50} = 5\sqrt{2}$

$RS = \sqrt{41}$

$SP = \sqrt{41}$

$P = 10\sqrt{2} + 2\sqrt{41}$

$P \approx 26.95$ units

3. $M(-3, 4)$, $N(1, 4)$, $P(4, 2)$, $Q(4, -1)$, and $R(2, 2)$

$MN = \sqrt{16} = 4$

$NP = \sqrt{13}$

$PQ = \sqrt{9} = 3$

$QR = \sqrt{13}$

$RM = \sqrt{29}$

$P = 7 + 2\sqrt{13} + \sqrt{29}$

$P \approx 19.60$ units

4. $A(-5, 1)$, $B(0, 3)$, $C(5, 1)$, $D(4, -2)$, $E(0, -4)$, and $F(-2, -4)$

$AB = \sqrt{29}$

$BC = \sqrt{29}$

$CD = \sqrt{10}$

$DE = \sqrt{20} = 2\sqrt{5}$

$EF = \sqrt{4} = 2$

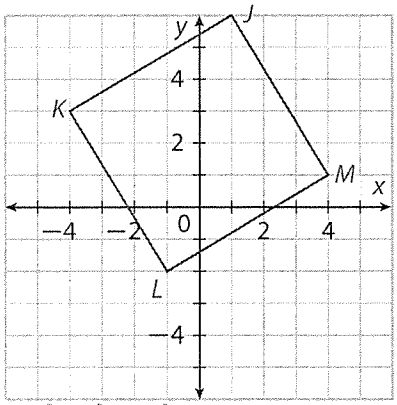
$FA = \sqrt{34}$

$P = 2\sqrt{29} + \sqrt{10} + 2\sqrt{5} + \sqrt{34} + 2$

$P \approx 26.24$ units

Find the area of each figure.

5.



Must check slopes:

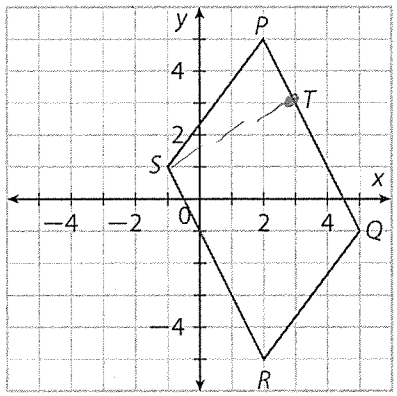
$m_{\overline{JK}} = \frac{3}{5}$ $m_{\overline{LM}} = \frac{3}{5}$ } sides are ∥

$m_{\overline{KL}} = -\frac{5}{3}$ $m_{\overline{JM}} = -\frac{5}{3}$ } and consecutive sides are ≅. So this is a SQ.

$JK = \sqrt{34}$ $KL = \sqrt{34}$

$A = \sqrt{34}\sqrt{34} = 34$ sq units

6.



(I) slope of $\overline{PQ} = -2$ $m_{\overline{PS}} = \frac{4}{3}$

$m_{\overline{RS}} = -2$ $m_{\overline{QR}} = \frac{4}{3}$

This is a ▱.

(II) Verify if $\overline{ST} \perp \overline{PQ}$. $m_{ST} = \frac{1}{2}$

So $\overline{ST} \perp PQ$

(III) $PQ = \sqrt{45} \to 3\sqrt{5}$

$ST = 2\sqrt{5}$

Area $= (3\sqrt{5})(2\sqrt{5})$

30 sq units

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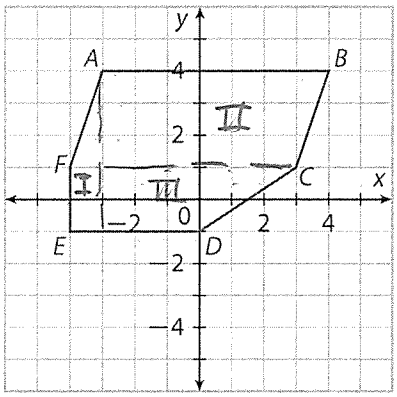
Find the area of each figure by addition.

7.



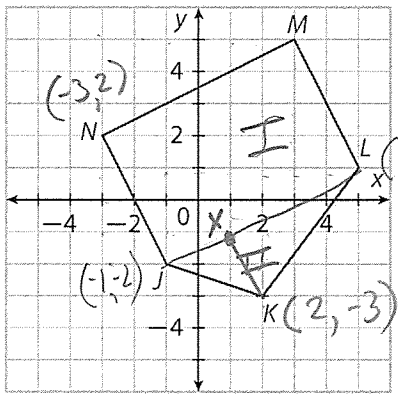
(I) Trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$
$= \frac{1}{2}(1)(2+5)$
$= 3\frac{1}{2}$

(II) Trapezoid: $A = \frac{1}{2}(3)(6+7)$
$= 19\frac{1}{2}$

(III) Trap: $A = \frac{1}{2}(2)(3+6)$
$= 9$

Area$_{ABCDEF}$ = 32 sq units

8.



(I) appears to be a rectangle:
$m_{\overline{MN}} = \frac{1}{2}$ $m_{\overline{JK}} = \frac{1}{2}$ $m_{\overline{NJ}} = -\frac{4}{2} = -2$
$m_{\overline{ML}} = -2$

JLMN is a rectangle.

$NJ = \sqrt{(-3+1)^2 + (2+2)^2} = 2\sqrt{5}$ $JL = \sqrt{(5+1)^2 + (1+2)^2} = 3\sqrt{5}$

$\text{Area}_I = (2\sqrt{5})(3\sqrt{5}) = 30$

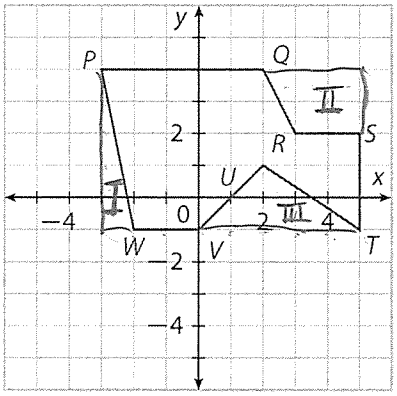
(II) Find altitude: $\overline{KX} \perp \overline{JL}$? $m_{\overline{KX}} = \frac{-3+1}{2-1} = -2$ yes.
K(+1, −1)

$JX = \sqrt{(-1-1)^2 + (-2+1)^2} = \sqrt{5}$ $KX = \sqrt{(2-1)^2 + (-3+1)^2} = \sqrt{5}$ $A = \frac{1}{2}\sqrt{5}\sqrt{5} = 2\frac{1}{2}$

Area = $32\frac{1}{2}$ SQ

Find the area of each figure by subtraction.

9.



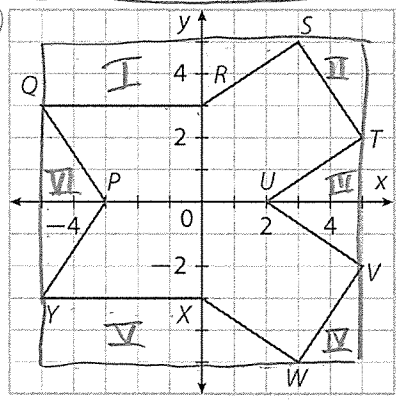
$A_{Rect} - (A_I + A_{II} + A_{III}) = A_{RQRSTUVW}$

$(8)(5) - \left(\frac{1}{2}(1)(5) + \frac{1}{2}(2)(3+2) + \frac{1}{2}(5)(2)\right) =$

$40 - \left(\frac{5}{2} + 5 + 5\right) =$

27.5 sq. units = $A_{RQRSTUVW}$

10.



$A_{Rect} - (A_I + A_{II} + A_{III} + A_{IV} + A_V + A_{VI}) = A_{polygon}$

$(10)(10) - \left(\frac{1}{2}(2)(5+8) + \frac{1}{2}(2)(3) + \frac{1}{2}(4)(3) + \frac{1}{2}(2)(3) + \frac{1}{2}(2)(8+5) + \frac{1}{2}(6)(2)\right)$

$100 - 44 = A_{polygon}$

56 SQ units = $A_{polygon}$

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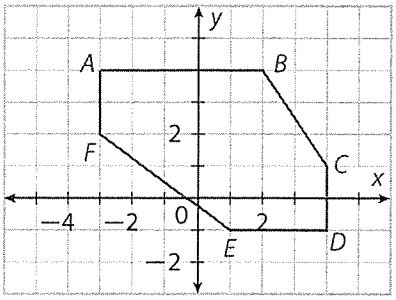
11. Fencing costs $1.45 per yard, and each unit on the grid represents 50 yd. How much will it cost to fence the plot of land represented by the polygon *ABCDEF*?



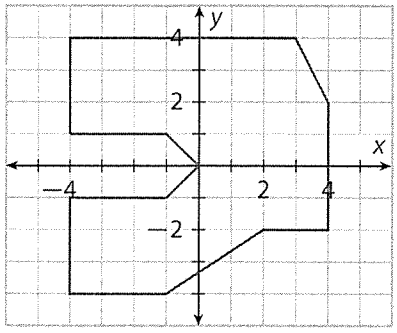
AB=5, CD=2, DE, 3, AF=2
BC=√13, EF=5

Perim = 17+√13
≈ 20.61 units.

20.61 × 50 yds = 1,030.5 yds.

$1,494.23

12. A machine component has a geometric-shaped plate, represented on the coordinate grid. Each unit on the grid represents 1 cm. Each plate is punched from an 8-cm square of alloy. The cost of the alloy is $0.43/cm^2, but $0.28/cm^2 can be recovered on wasted scraps of alloy. What is the net cost of alloy for each component?



13. $\triangle ABC$ with vertices $A(1, 1)$ and $B(3, 5)$ has an area of 10 units^2. What is the location of the third vertex? Select all that apply.

A. $C(-5, 5)$

B. $C(3, -5)$

C. $C(-2, 5)$

D. $C(6, 1)$

E. $C(3, -3)$

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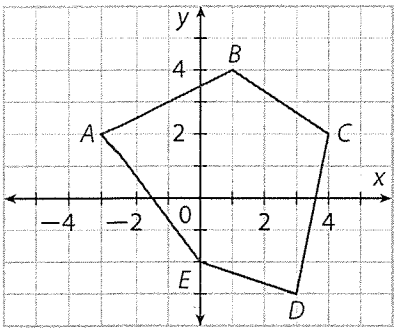
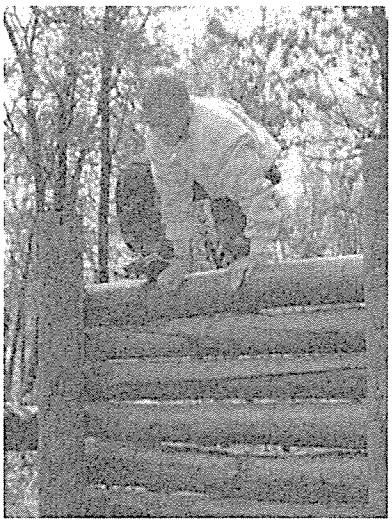
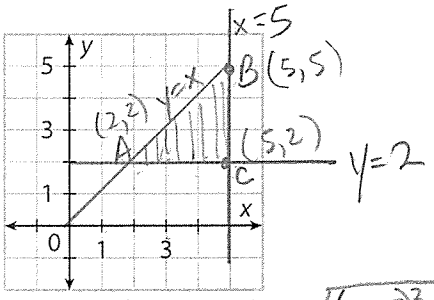
14. Pentagon *ABCDE* shows the path of an obstacle course, where each unit of the coordinate plane represents 10 meters. Find the length of the course to the nearest meter.





Algebra **Graph each set of lines to form a triangle. Find the area and perimeter.**

15. $y = 2$, $x = 5$, and $y = x$



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

$= \frac{9}{2}$

$= 4\frac{1}{2}$ SQ units

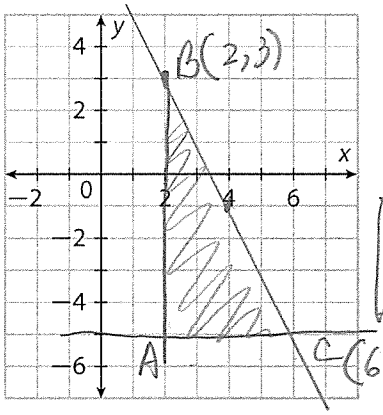
$AB = \sqrt{(2-5)^2 + (2-5)^2}$

$= \sqrt{18} = 3\sqrt{2}$

$P = 3\sqrt{2} + 3 + 3$

$P = 6 + 3\sqrt{2}$

16. $y = -5$, $x = 2$, and $y = -2x + 7$



Perim:

$AB = 8$, $AC = 4$,

$BC = \sqrt{(4^2) + (-8)^2}$

$\sqrt{80} = 4\sqrt{5}$

$P = 12 + 4\sqrt{5}$

$P \approx 20.94$ units

$A = \frac{1}{2}(4)(8)$

$A = 16$ SQ units

17. Prove that quadrilateral *JKLM* with vertices $J(1, 5)$, $K(4, 2)$, $L(1, -4)$, and $M(-2, 2)$ is a kite, and find its area.

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