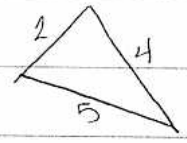
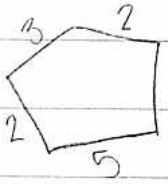
Geo 8

Perimeters of polygons

perimeter - distance around.

ex 

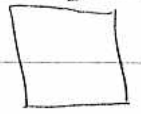
Perimeter = $P = 2+4+5$
$= 11$



$P = 3+2+4+5+2 = 16$

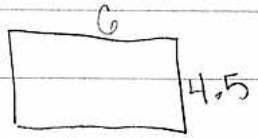
etc.

perimeter of a square = $P = 4s$

ex 

$P = 4(2) = 8$

perimeter of a rectangle = $P = 2L + 2W$

ex 

$P = 2(6) + 2(4.5) = 12 + 9 = 21$

note: make sure same units.

ex I'm building a rectangular garden. I have 44 ft. of lumber. I want the length to be 2ft less than 3 times the width. What are the dimensions?

$P = 2L + 2w = 44$

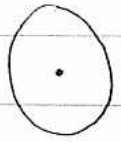
$2(3w-2) + 2w = 44$

$6w - 4 + 2w = 44$

$8w = 48$

Circles

Circle - the set of points in a plane that are a fixed distance from a point (called the center).

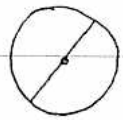
ex 

radius - a segment from the circle to the center

ex 

diameter - a segment that connects two points on the circle and goes through the center.

ex 

or 

note: $d = 2r$

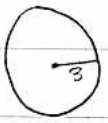
Circumference of a Circle

Circumference - the distance around a circle, C

Formula for C

$C = 2\pi r$ (or $C = \pi d$, d = diameter)

ex) find C of



$C = 2\pi \cdot 3$

$= 6\pi$

≈ 18.85

I could give you C and ask for r

ex) C = 15, what's r = ?

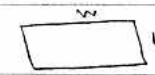
$15 = 2\pi r$

$\frac{15}{2\pi} = r$

$r \approx 2.39$

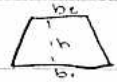
Areas of Polygons

Square  $A = s^2$

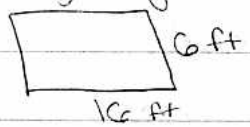
Rectangle  $A = lw$

Parallelogram  $A = bh$

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

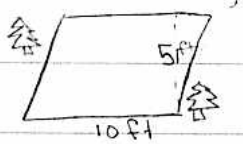
Trapezoid  $A = \frac{1}{2}h(b_1 + b_2)$

(ex) my garden from before, what was the area

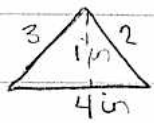


$A = 6(16) = 96\ ft^2$

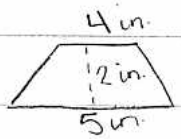
(ex.) It happens that where I want to put my garden has some trees in the way. So I have to slant my garden



$A = 5(10) = 50\ ft^2$

(ex) Find area of 

$A = \frac{1}{2}bh = \frac{1}{2} \cdot 4 \cdot 1 = 2\ in^2$

(ex) Area of 

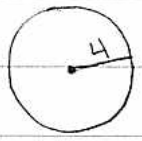
$A = \frac{1}{2} \cdot 2 \cdot (5+4) = \frac{1}{2} \cdot 2 \cdot 9 = 1 \cdot 9 = 9\ in^2$

Area of a Circle

Formula

$A = \pi r^2$

ex) find area of



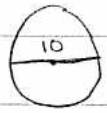
$A = \pi(4)^2$

$= 16\pi$

≈ 50.27

Be careful! You need the radius

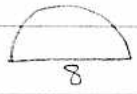
ex)



$A = \pi(5)^2 \approx 78.54$

Could do a semicircle

ex)

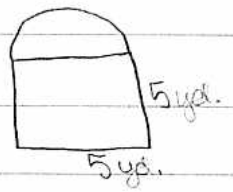


radius = 4

$\text{Area}_{\text{circle}} = \pi(4)^2 \approx 50.27$

$A_{\text{semicircle}} = \frac{\pi r^2}{2} \approx \frac{50.27}{2} \approx \boxed{25.13}$

ex)



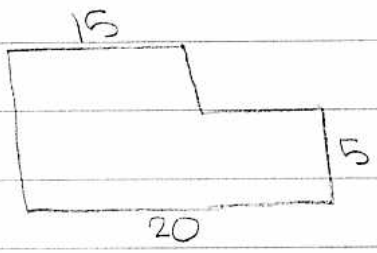
$A_{\text{square}} = 5 \cdot 5 = 25$

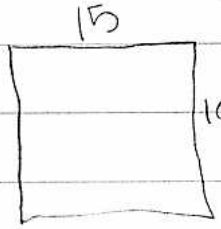
$A_{\text{semicircle}} = \frac{\pi(2.5)^2}{2} \approx 9.82$

$A_{\text{whole thing}} \approx 25 + 9.82 \approx 34.82$

Areas of figures that are combinations of polygons

Sometimes we have figures that are made up of other figures.

ex 

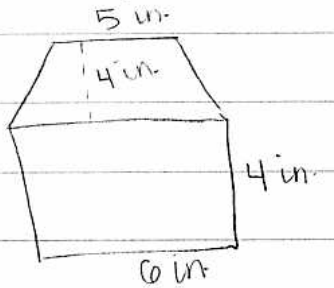
$=$ 

$+$ 

$= 15 \cdot 10 + 5 \cdot 5$

$= 150 + 25$

$= 175$

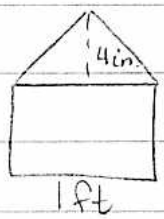
ex 

$A_{rect} + A_{trap} = 6 \cdot 4 + \frac{1}{2} \cdot 4(6+5)$

$= 24 + 2(11) = 24 + 22$

$= 46 \text{ in}^2$

Be careful of units

ex 

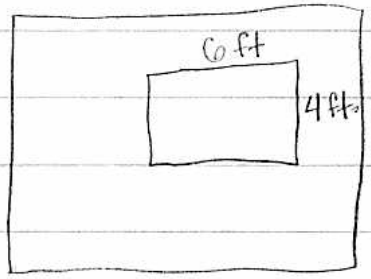
$A = 12 \cdot 6 + \frac{1}{2} \cdot 12 \cdot 4$

$= 72 + 24$

$= 96 \text{ in}^2$

Might be missing area

ex Wall w/ window



$A = A_{wall} - A_{window}$

$= 10 \cdot 8 - 4 \cdot 6$

$= 80 - 24$

$= 56 \text{ ft}^2$