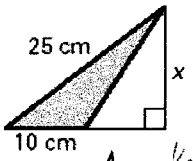
Honors Geometry Lessons 11-1 to 11-3 Review **Name** Key
SHOW ALL WORK FOR FULL CREDIT!!

1.) Find the value of x.

a.) Area = 70 cm^2

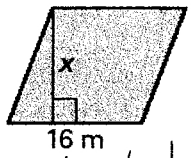


Formula: $A = \frac{1}{2} b \cdot h$

$70 = \frac{1}{2} \cdot 10 \cdot x$

$x = 14$

b.) Area = 104 m^2

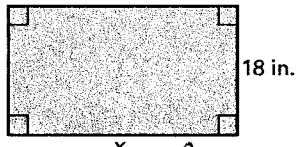


Formula: $A = b \cdot h$

$104 = 16x$

$x = 6.5$

c.) Area = 576 in^2.



Formula: $A = \ell \cdot w$

$576 = x \cdot 18$

$x = 32$

2.) The lengths of the hypotenuse and one leg of a right triangle are given. Find the perimeter AND area of the triangle.

a.) Hypotenuse: 53 in.; leg: 45 in.

$45^2 + x^2 = 53^2$

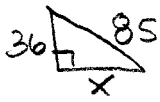
$x = 28$

$P = 126$ in

$A = \frac{1}{2}(45)28$

$A = 630\ in^2$

b.) Hypotenuse: 85 mm; leg: 36 mm



$36^2 + x^2 = 85^2$

$x = 77$

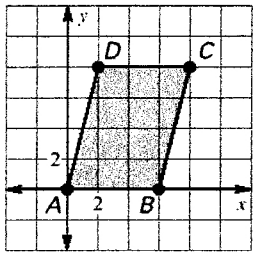
$P = 198$ mm

$A = \frac{1}{2}(36)(77)$

$A = 1386\ mm^2$

3.) Find the area of the quadrilateral.

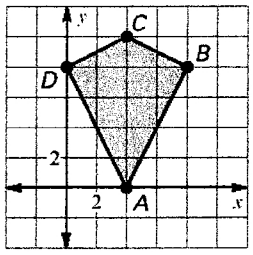
a.)



$A = b \cdot h$

$A = 6 \cdot 8 = 48u^2$

b.)

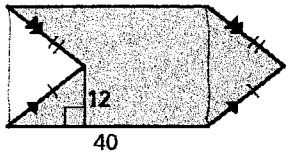


$A = \frac{1}{2} d_1 \cdot d_2$

$= \frac{1}{2}(10 \cdot 8) = 40u^2$

4.) Find the area of the shaded polygon.

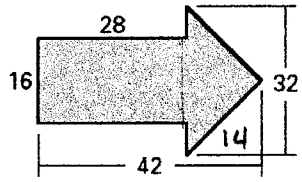
a.)



$A = \ell \cdot w = 40(24)$

$= 960\ u^2$

b.)



$A_R = 16 \cdot 28 = 448$

$A_T = \frac{1}{2} 32 \cdot 14 = 224$

$A_{sum} = 672u^2$

5.) The area of a triangle is 225 square units. The base of the triangle is twice the height. Find the base and the height.

$A = \frac{1}{2}b \cdot h$

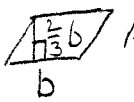
$225 = \frac{1}{2}(2h)h$

$225 = h^2$

$h = 15$

$b = 30$

6.) The area of a parallelogram is 216 square centimeters. The height of the parallelogram is two thirds its base. Find the base and the height.



$A = 216$

$216 = \frac{2}{3}b \cdot b$

$\frac{3}{2}(216) = b^2$

$b = 18\text{cm}$ $h = 12\text{cm}$

7.) The area of a square is 256 square units. Find the side length and perimeter of the square.

$A = 256$ $256 = s^2$

$s = 16$

$P = 4(16) = 64u$ $s = 16$

8.) The area of a rectangle is 84 square inches. The length of the rectangle is 2 inches longer than twice the width. Find the width and the perimeter of the rectangle.

$A = lw$ $l = 2w+2$

$84 = w(2w+2)$

$84 = 2w^2 + 2w$

$0 = 2w^2 + 2w - 84$

$0 = w^2 + w - 42$

$0 = (w-6)(w+7)$

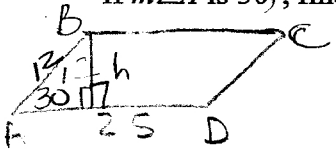
$w = 6$ $w \neq -7$

$P = 2(6) + 2[2 \cdot 6 + 2]$

$= 12 + 2(14)$

$P = 40u$

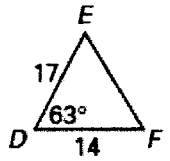
9.) In parallelogram *ABCD*, base $\overline{AD}$ is 25 units and $\overline{AB}$ is 12 units. If $m\angle A$ is 30°, find the height and area of parallelogram *ABCD*.



$h = 6$ $A = 25 \cdot 6 = 150u^2$

10.) Find the area of each triangle below.

a.)

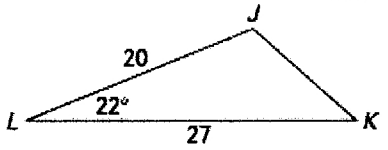


$A = \frac{1}{2}a \cdot b \cdot \sin 63$

$= \frac{1}{2}17(14)\sin 63$

$A \approx 106u^2$

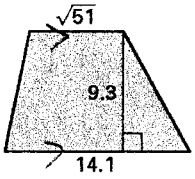
b.)



$A = \frac{1}{2}20 \cdot 27 \sin 22° \approx 101u^2$

11.) Find the area of each polygon below.

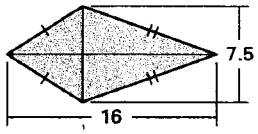
a.)



$A_T = \frac{1}{2}9.3(\sqrt{51} + 14.1)$

$= 98.77u^2$

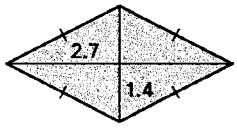
b.)



$A_K = \frac{1}{2}16(7.5)$

$= 60u^2$

c.)

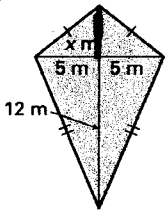


$A_{Ro} = \frac{1}{2}(5.4)(2.8)$

$= 7.56u^2$

12.) Use the given information to find the value of *x*.

a.) Area = 80 m²



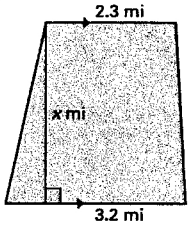
$80 = \frac{1}{2}10(12+x)$

$80 = 5(12+x)$

$16 = 12 + x$

$x = 4$

b.) Area = 5.5 mi²

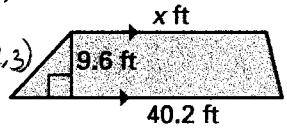


$5.5 = \frac{1}{2}x(3.2+2.3)$

$11 = x(5.5)$

$x = 2$

c.) Area = 288.96 ft²



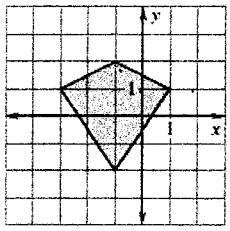
$288.96 = \frac{1}{2}(9.6)(40.2+x)$

$288.96 = 4.8(40.2+x)$

$60.2 = 40.2 + x$

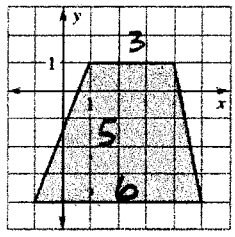
$x = 20\text{ ft}$

13.) Find the area of the figure.

a.) 

$A = \frac{1}{2} d_1 \cdot d_2$

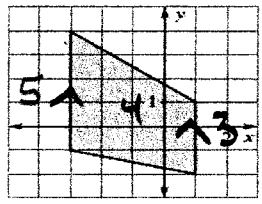
$= \frac{1}{2} 4 \cdot 4 = \boxed{8u^2}$

b.) 

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

$= \frac{1}{2} 5 (3+6)$

$= \frac{1}{2} 5 (9) = \boxed{22.5u^2}$

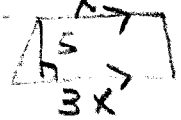
c.) 

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

$= \boxed{16u^2}$

14.) Find the lengths of the bases of the trapezoid described.

a.) The height is 5 meters.
One base is 3 times as long as the other base.
The area is 70 square meters.

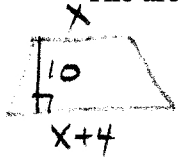


$70 = \frac{1}{2} 5 (x + 3x)$

$140 = 5(4x)$

$x = \boxed{7 = b_1 \quad b_2 = 21}$

b.) The height is 10 feet.
One base is 4 feet longer than the other base.
The area is 120 square feet.



$120 = \frac{1}{2} 10 (x + x + 4)$

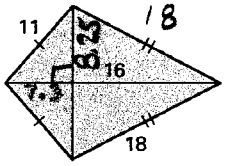
$120 = 5(2x+4)$

$24 = 2x + 4$

$20 = 2x$

$\boxed{x = 10 = b_1 \quad b_2 = 14}$

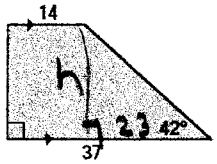
15.) Find the area of the shaded region.

a.) 

$A = \frac{1}{2} d_1 \cdot d_2$

$= \frac{1}{2} (23.3)(16.5)$

$= \boxed{192.2u^2}$

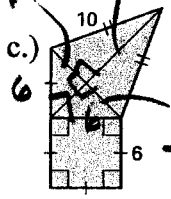
b.) 

$\tan 42° = \frac{h}{23}$

$h = 20.7$

$A_{TRAP} = \frac{1}{2} (20.7)(14+37)$

$\approx \boxed{527.9}$

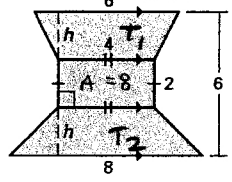
c.) 

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

$A = \square + \triangle + \triangle$

$= 36 + \frac{1}{2}(36) + \frac{1}{2} 6\sqrt{2} \cdot 9.1$

$= 36 + 18 + 38.4 = \boxed{92.4u^2}$

d.) 

$T_1 = \frac{1}{2}(2)(6+4) = 10u^2$

$T_2 = \frac{1}{2}(2)(4+8) = 12u^2$

$A_{TRAP} = R + T_1 + T_2$

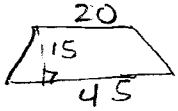
$= 8 + 10 + 12 = \boxed{30u^2}$

16.) The garage roof shown is made from two isosceles trapezoids and two isosceles triangles.
Find the area of the entire roof.

$A_\triangle = \frac{1}{2}(15)(25) = 187.5$

$\times \quad 2$

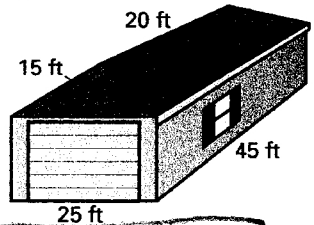
$375 ft^2$



$A_{TRAP} = \frac{1}{2}(15)(20+45) = 487.5$

$\times \quad 2$

$975 ft^2$



$\boxed{1350 ft^2}$

17.) The ratio of the areas of two similar figures is given. Write the ratio of the lengths of corresponding sides.

a.) Ratio of areas = 169:144

$\frac{a^2}{b^2} = \frac{169}{144} \quad \frac{a}{b} = \frac{13}{12}$

b.) Ratio of areas = 112:196

$\frac{a^2}{b^2} = \frac{112}{196} \quad \frac{a}{b} = \frac{\sqrt{112}}{\sqrt{196}} = \frac{4\sqrt{7}}{14} = \boxed{\frac{2\sqrt{7}}{7}}$

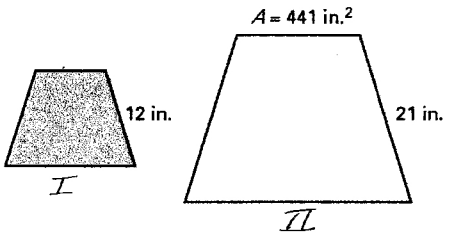
c.) Ratio of areas = 125:108

$\frac{a^2}{b^2} = \frac{125}{108} \quad \frac{a}{b} = \frac{\sqrt{125}}{\sqrt{108}}$

$= \frac{5\sqrt{5}}{6\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{5\sqrt{15}}{18}}$

18.) The polygons are similar.
Find the ratio (shaded to unshaded) of the perimeters and of the areas. Find the unknown area.

a.)



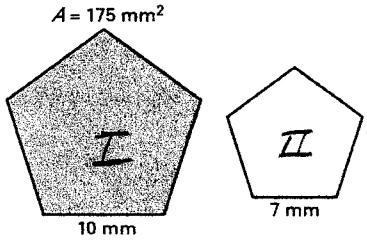
$P: \frac{12}{21} = \boxed{\frac{4}{7}}$

$A: \frac{4^2}{7^2} = \boxed{\frac{16}{49}}$

$\frac{16}{49} = \frac{A_I}{441}$

$\boxed{A_I = 144 in^2}$

b.)



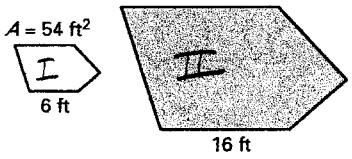
$P: \boxed{\frac{10}{7}}$

$A: \frac{10^2}{7^2} = \boxed{\frac{100}{49}}$

$\frac{100}{49} = \frac{175}{A_{II}}$

$\boxed{A_{II} = 85.75 mm^2}$

c.)



$P: \frac{16}{6} = \frac{8}{3}$

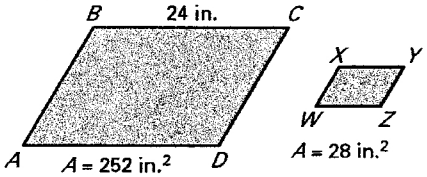
$A: \frac{8^2}{3^2} = \boxed{\frac{64}{9}}$

$\frac{64}{9} = \frac{A_{II}}{54}$

$\boxed{A_{II} = 384 ft^2}$

19.) Use the given area to find *XY*.

a.) $ABCD \sim WXYZ$



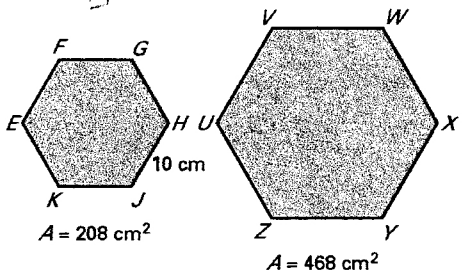
$\frac{24^2}{(XY)^2} = \frac{252}{28}$

$28(24)^2 = XY^2(252)$

$64 = XY^2$

$\boxed{XY = 8}$

b.) $EFGHJK \sim UVWXYZ$



$\frac{10^2}{XY^2} = \frac{200}{468}$

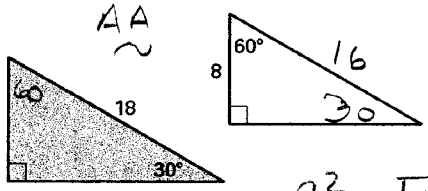
$100(468) = 208(XY)^2$

$225 = (XY)^2$

$\boxed{XY = 15}$

20.) Find the ratio (shaded to unshaded) of the areas.

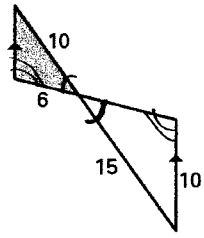
a.)



$SF = \frac{18}{16} = \frac{9}{8}$

$\frac{9^2}{8^2} = \boxed{\frac{81}{64}} = \frac{A_S}{A_U}$

b.)



AA ~

$SF = \frac{10}{15} = \frac{2}{3}$

$\frac{2^2}{3^2} = \boxed{\frac{4}{9}} = \frac{A_S}{A_U}$

21.) Use the information about a pair of similar polygons to find all possible values of *x*.

a.) The area of ΔABC is 5.
The area of ΔDEF is $x^2 + 9$.
The perimeter of ΔABC is 2.
The perimeter of ΔDEF is x.

$\frac{2^2}{x^2} = \frac{5}{x^2+9}$

$4(x^2+9) = 5x^2$

$4x^2 + 36 = 5x^2$

$36 = x^2$

$\boxed{x = 6}$

b.) The area of *HIJK* is $x + 4$.
The area of *STUV* is 5.
The perimeter of *HIJK* is $\frac{x}{2}$.
The Perimeter of *STUV* is $\sqrt{x}$

$\frac{\left(\frac{x}{2}\right)^2}{(\sqrt{x})^2} = \frac{x+4}{5}$

$\frac{x^2}{4}(5) = x(x+4)$

$5x^2 = 4x^2 + 16x$

$x^2 - 16x = 0$

$x(x-16) = 0$

$x = 0$ or $\boxed{x = 16}$