Geometry Test 2 Review Sheet pg 1

Algebra Test 2 Review Sheet pg 1

1. Recall that an irrational number is number that can't be written as a fraction $\frac{p}{q}$ with p and q integers.

a) $\sqrt{36} = \boxed{6}$ b) $\sqrt{64} = \boxed{8}$ c) $\sqrt{121} = \boxed{11}$ d) $\pm\sqrt{81} = \boxed{\pm 9}$

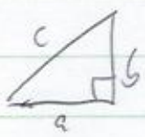
e) $\sqrt{0.25} = \sqrt{\frac{25}{100}} = \frac{\sqrt{25}}{\sqrt{100}} = \boxed{\frac{5}{10}}$ f) $\sqrt{0.09} = \sqrt{\frac{9}{100}} = \frac{\sqrt{9}}{\sqrt{100}} = \boxed{\frac{3}{10}}$

g) $\sqrt{27} = \sqrt{9 \cdot 3} = \sqrt{9} \cdot \sqrt{3} = 3\sqrt{3}$ ← irrational

As a decimal approximation $\sqrt{27} \approx \boxed{5.20}$

h) $\sqrt{75} = \sqrt{25 \cdot 3} = \sqrt{25} \cdot \sqrt{3} = 5\sqrt{3}$ ← irrational

As a decimal approximation $\sqrt{75} \approx \boxed{8.66}$

2. All problems use the Pythagorean Theorem  $a^2 + b^2 = c^2$

a) $a^2 + b^2 = c^2$ $a = 3, b = 4$

$3^2 + 4^2 = c^2$

$9 + 16 = c^2$

$25 = c^2$

$\boxed{5 = c}$

b) $a = 8, b = ?, c = 10$

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

$8^2 + b^2 = 10^2$

$64 + b^2 = 100$

$-64 \qquad -64$

$b^2 = 36$

$\boxed{b = 6}$

c) $a = 12, b = 5, c = ?$

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

$12^2 + 5^2 = c^2$

$144 + 25 = c^2$

$169 = c^2$

$\boxed{13 = c}$

e) $a = 1, b = 1$ $c = ?$

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

$1^2 + 1^2 = c^2$

$2 = c^2$

$\boxed{\sqrt{2} = c}$

d) $c^2 = 16$ $b = ?$ $c = 20$

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

$16^2 + b^2 = 20^2$

$256 + b^2 = 400$

$-256 \qquad -256$

$b^2 = 144$

$\boxed{b = 12}$

Geometry Review

3. If $a^2+b^2=c^2$ it is a right triangle.

a) $2^2+3^2 \stackrel{?}{=} 4^2$

$4+9 \stackrel{?}{=} 16$ ✗

No, not right

b) $3^2+4^2 \stackrel{?}{=} 5^2$

$9+16 \stackrel{?}{=} 25$ ✓

Yes right

c) $6^2+8^2 \stackrel{?}{=} 10^2$

$36+64 \stackrel{?}{=} 100$ ✓

Yes right

d) $1^2+1^2 \stackrel{?}{=} (\sqrt{2})^2$

$2 \stackrel{?}{=} 2$ ✓

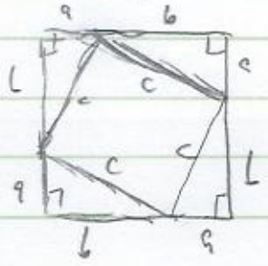
Yes right

e) $1^2+(\sqrt{2})^2 \stackrel{?}{=} (\sqrt{3})^2$

$1+2 \stackrel{?}{=} 3$ ✓

Yes right

4. a) If our triangle is  we set



b) Area of big square = Area of small square + 4 Area of triangles

$(a+b)^2 = c^2 + 4\cdot\frac{1}{2}ab$

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

$-2ab \qquad -2ab$

$a^2+b^2=c^2$ ▨

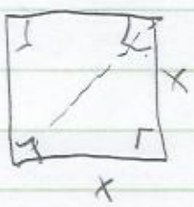
5. 

For all of our problems we have this setup.
$d^2 = x^2 + y^2 + z^2$

a) $d^2 = 3^2 + 4^2 + 5^2$
$d^2 = 9 + 16 + 25$
$d^2 = 50$
$d = \sqrt{50} = \sqrt{25 \cdot 2}$
$\boxed{d = 5\sqrt{2}}$

b) $d^2 = x^2 + y^2 + z^2$
$d^2 = 1^2 + 2^2 + 2^2$
$d^2 = 1 + 4 + 4$
$d^2 = 9$
$\boxed{d = 3}$

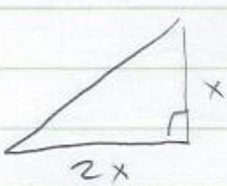
c) $d^2 = x^2 + y^2 + z^2$
$d^2 = 1^2 + 5^2 + 7^2$
$d^2 = 1 + 25 + 49$
$d^2 = 75$
$d = \sqrt{75} = \sqrt{25 \cdot 3}$
$\boxed{d = 5\sqrt{3}}$

6. 

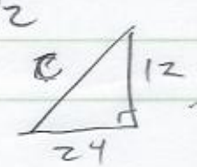
Area = 81
$x^2 = 81$
$x = 9$

Diagonal$^2 = x^2 + x^2$
Diagonal$^2 = 9^2 + 9^2$
Diagonal$^2 = 162$
$\boxed{\text{Diagonal} = \sqrt{162}}$

7. Using problem 5 formula $d^2 = x^2 + y^2 + z^2$
$d^2 = 5^2 + 5^2 + 5^2$
$d^2 = 75$
$d = \sqrt{75}$
$\boxed{d = 5\sqrt{3}}$

8. 

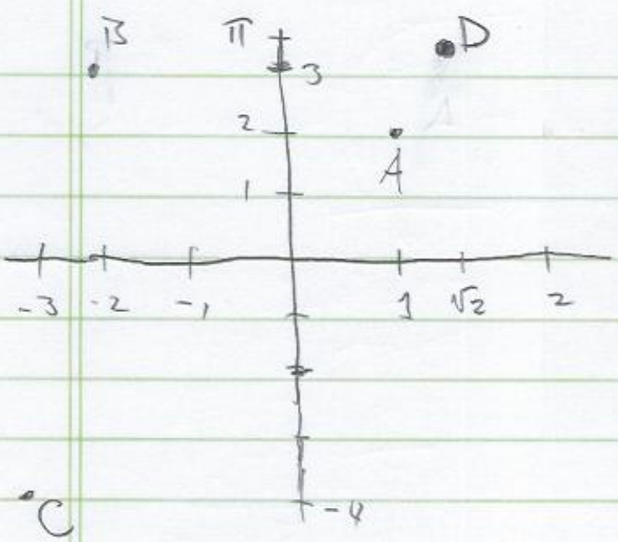
Area = 144
$\frac{1}{2}$ base · height = 144
$\frac{1}{2} \cdot 2x \cdot x = 144$
$x^2 = 144$
$x = 12$

So 

$c^2 = a^2 + b^2$
$c^2 = 12^2 + 24^2$
$c^2 = 144 + 576$
$c^2 = 720$
$\boxed{c = \sqrt{720}}$

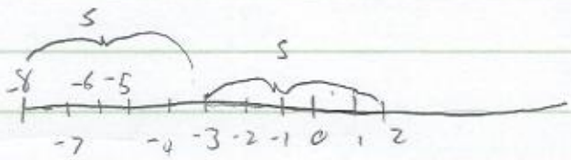
Geometry Test Review

9.)



10. a) 5 b) 11 c) 5

11.

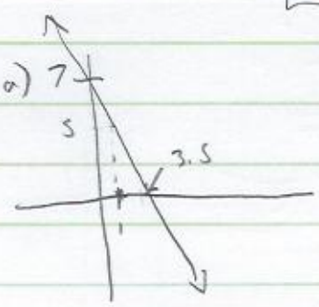


$d(-3, x) = 5$

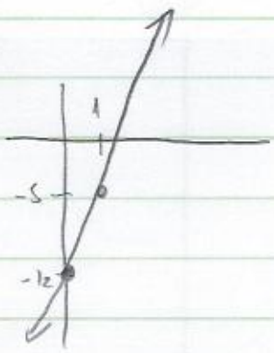
$|-3 - x| = 5$

$\boxed{x = -8}$ or $\boxed{x = 2}$

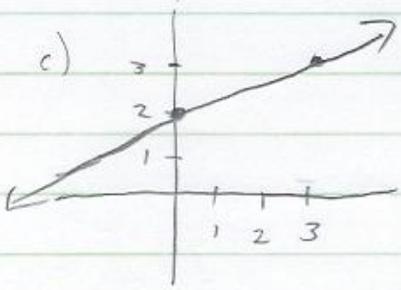
12. a)



b)



c)



3. a) $(-1,1)$ and $(2,-5)$ (x_1, y_1 and x_2, y_2)

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

$y = mx + b$

5. $y = -3x + b$ plug in $(-1,1)$

$1 = -3 \cdot (-1) + b$

$1 = 4 + b$

$-4 \quad -4$

$-3 = b$

$y = -3x + -3$

b) $(2, 1/2)$, $(3, 5)$

$m = \frac{5 - 1/2}{3 - 2} = 4.5$

$y = 4.5x + b$ plug in $(3, 5)$

$5 = 4.5 \cdot 3 + b$

$5 = 13.5 + b$

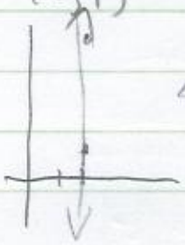
$-13.5 \quad -13.5$

$-8.5 = b$

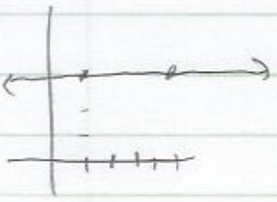
$y = 4.5x - 8.5$

c) $(2,1)$ $(2,8)$

$x = 2$



d)



$y = 3$

e)

$x = \pi$

f) $(\sqrt{2}, 1)$ $(\pi, 3)$

$m = \frac{3-1}{\pi - \sqrt{2}} = \frac{2}{\pi - \sqrt{2}}$

$y = \frac{2}{\pi - \sqrt{2}} x + b$ plug in $(\pi, 3)$

$3 = \frac{2}{\pi - \sqrt{2}} \cdot \pi + b$

$3 - \frac{2}{\pi - \sqrt{2}} = b$

5. $y = \frac{2}{\pi - \sqrt{2}} x + 3 - \frac{2}{\pi - \sqrt{2}}$

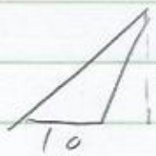
Geometry Test 2 Review

14. LIN. Pg 1
PAR1 Pg 3
PAR2 Pg 3
PAR3 Pg 3
DIST1 Pg 8
DIST2 Pg 8
SEG Pg 9
PERP1 Pg 37
PERP2 Pg 37
PD Pg 39
RT Pg 47

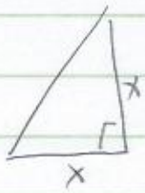
15, 16, 17, 18 in solution guide

19. 

$\text{Area} = \frac{1}{2} \cdot b \cdot h$
$= \frac{1}{2} \cdot 10 \cdot 20$
$= 100$

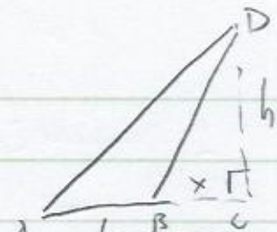
20. 

$\text{Area} = \frac{1}{2} \cdot b \cdot h$
$= \frac{1}{2} \cdot 5 \cdot 10$
$= 25$

21. 

$\text{Area} = 60$
$\frac{1}{2} bh = 60$
$\frac{1}{2} x^2 = 60$
$x^2 = 120$
$x = \sqrt{120}$

22.



Need to show area of $\triangle ABC = \frac{1}{2} b \cdot h$

We know

Area of $\triangle ABC$ = Area $\triangle ACD$ − Area $\triangle BCD$

$= \frac{1}{2}(b+x) \cdot h - \frac{1}{2} x h$

$= \frac{1}{2} bh + \frac{1}{2} xh - \frac{1}{2} xh$

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

Because $\triangle ACD$ and $\triangle BCD$ are both right triangles

23. Area $= \frac{1}{2}(6+10) \cdot 5$

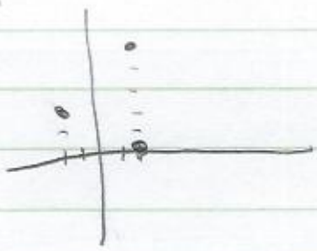
$= 8 \cdot 5$

$= \boxed{40}$

24. See soln guide

25. distance $(3,5)$ to $(-2,2)$ is $\sqrt{(2-(-2))^2 + (5-2)^2} = \sqrt{4^2+3^2} = \boxed{5}$

distance $(3,5)$ to $(3,0)$ is $\sqrt{(3-3)^2 + (5-0)^2} = \sqrt{0^2+5^2} = \boxed{5}$



27. a) $d = \sqrt{(8-4)^2 + (5-3)^2 + (2-1)^2} = \sqrt{4^2+2^2+1^2} = \boxed{\sqrt{21}}$

b) $d = \sqrt{(-5-2)^2 + (-4-0)^2 + (-3-(-1))^2} = \sqrt{7^2+4^2+4^2} = \sqrt{81} = \boxed{9}$

28. Pg 116 is Section 4.2