

UNIT 6 - GEOMETRY REVIEW SHEET

Part 1: Simplifying radicals.

$$1. 5\sqrt{6} \cdot \frac{1}{6}\sqrt{216}$$

$$\frac{5}{6}\sqrt{1296}$$

$$\frac{5}{6}(36)$$

$$= 30$$

$$2. -21\sqrt{27x^5}$$

$$-21\sqrt{(3 \cdot 3 \cdot 3) \cdot 3 \cdot x \cdot x \cdot x \cdot x \cdot x}$$

$$-21(3)xx\sqrt{3x}$$

$$-103x^2\sqrt{3x}$$

$$3. 3\sqrt{98a^3b^7}$$

$$3\sqrt{(2 \cdot 7 \cdot 7) \cdot 2 \cdot 7 \cdot a \cdot a \cdot a \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b}$$

$$3(7)abbb\sqrt{2ab}$$

$$21ab^3\sqrt{2ab}$$

$$4. \sqrt{12} \cdot \sqrt{75}$$

$$\sqrt{900}$$

$$= 30$$

Part 2: Solving radical equations.

$$5. 3 - \sqrt{x} = -2$$

$$-3 -3$$

$$-\sqrt{x} = -5$$

$$\sqrt{x} = 5$$

$$x = 25$$

check:
 $3 - \sqrt{25} = -2$
 $3 - 5 = -2$
 $-2 = -2 \checkmark$

$$6. \sqrt{10b+6} = 6$$

$$\sqrt{10b+6} = 6$$

$$10b+6 = 36$$

$$10b = 30$$

$$b = 3$$

check:
 $\sqrt{10(3)+6} = 6$
 $\sqrt{30+6} = 6$
 $\sqrt{36} = 6$
 $6 = 6 \checkmark$

$$7. \sqrt{n+5} = \sqrt{5n-11}$$

$$n+5 = 5n-11$$

$$5 = 4n-11$$

$$16 = 4n$$

$$n = 4$$

check:
 $\sqrt{4+5} = \sqrt{5(4)-11}$
 $\sqrt{9} = \sqrt{20-11}$
 $3 = \sqrt{9}$
 $3 = 3 \checkmark$

$$8. -2\sqrt{2r+5} = 6$$

$$-\sqrt{2r+5} = 3$$

$$\sqrt{2r+5} = -3$$

$$2r+5 = 9$$

$$2r = 4$$

$$r = 2$$

check:
 $-2\sqrt{2(2)+5} = 6$
 $-2\sqrt{4+5} = 6$
 $-2\sqrt{9} = 6$
 $-6 = 6$

$$-2\sqrt{9} = 6$$

$$-2(3) = 6$$

$$-6 = 6$$

NO SOLUTION

Part 3: Pythagorean Theorem.

9. The area of a square is 49in^2 . Find the length of its diagonal. Leave your answer as a simplified radical.

$$A = s^2$$

$$49 = s^2$$

$$s = 7$$



$$7^2 + 7^2 = c^2$$

$$49 + 49 = c^2$$

$$98 = c^2$$

$$c = \sqrt{98} = \sqrt{2 \cdot 7 \cdot 7}$$

$$c = 7\sqrt{2}$$

10. Determine if the following sides lengths create a right triangle: 13, 38, 35

$$13^2 + 35^2 = 38^2$$

$$169 + 1225 = 1444$$

$$1394 \neq 1444$$

NO!

11. If you walked 3 blocks north and then 8 blocks west and then 10 blocks south, how far are you from your starting point if each block is $\frac{2}{10}$ of a mile?



$$8^2 + 7^2 = x^2$$

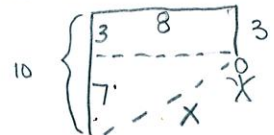
$$64 + 49 = x^2$$

$$x^2 = 113$$

$$x = 10.6 \times \left(\frac{2}{10}\right)$$

$$x = 2.12 \text{ miles}$$

see Below ↓



Part 4: Distance and Midpoint

Find the distance and midpoint between each pair of points.

12. A(3,5) and B(8,5)

$$d = \sqrt{(8-3)^2 + (5-5)^2} \quad x_m = \frac{3+8}{2} = \frac{11}{2}$$

$$d = \sqrt{5^2 + 0^2}$$

$$d = \sqrt{25}$$

$$y_m = \frac{5+5}{2} = \frac{10}{2} = 5$$

$d = 5$

mid = $(\frac{11}{2}, 5)$

13. A(10,-2) and B(-6,3)

$$d = \sqrt{(-6-10)^2 + (3-(-2))^2} \quad x_m = \frac{-6+10}{2} = \frac{4}{2} = 2$$

$$d = \sqrt{(-16)^2 + (5)^2}$$

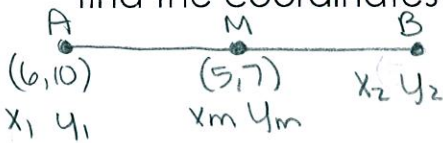
$$d = \sqrt{256 + 25}$$

$$y_m = \frac{3+(-2)}{2} = \frac{1}{2}$$

$d = \sqrt{281}$

mid = $(2, \frac{1}{2})$

14. M is the midpoint of AB. If A is located at (6,10) and M is located at (5,7), find the coordinates of B.



$$5 = \frac{6 + x_2}{2}$$

$$10 = 6 + x_2$$

$$4 = x_2$$

$$7 = \frac{10 + y_2}{2}$$

$$14 = 10 + y_2$$

$$4 = y_2$$

B
(4, 4)

Part 5: Geometry

15. Find the perimeter of a triangle if the vertices are located at A(2,1) B(6,-3) and C(1,-7).

see below

$P = 20.12$ units

16. The volume of a cylinder is 1526.04 in³. If the height is 6in, find the length of the diameter.

$$V = \pi r^2 h$$

$$1526.04 = (3.14)r^2(6)$$

$$1526.04 = 18.84r^2$$

$$81 = r^2$$

$$9 = r$$

$$\text{Diameter} = 2r$$

$$d = 2(9)$$

$d = 18$ in

17. Find the volume of a sphere if the circumference around the sphere is 31.4 inches.

$$V = \frac{4\pi r^3}{3}$$

$$31.4 = 2(3.14)r$$

$$31.4 = 6.28r$$

$$r = 5$$

$$V = \frac{4(3.14)(5^3)}{3}$$

$V = 523.3$ in³

18. If you double the radius of a sphere, how many times greater is the new volume?

$$r = 1$$

$$r = 2$$

$$V = \frac{4(3.14)(1^3)}{3}$$

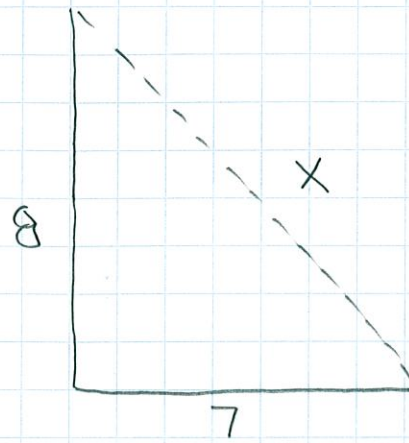
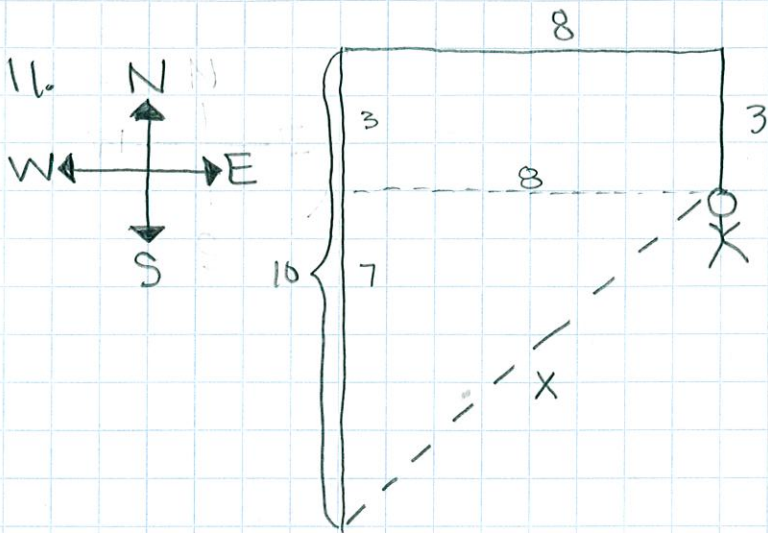
$$V = 4.187$$

$$V = \frac{4(3.14)(2^3)}{3}$$

$$V = 33.493$$

$$\frac{33.493}{4.187} =$$

8 times greater



$$8^2 + 7^2 = X^2$$

$$64 + 49 = X^2$$

$$113 = X^2$$

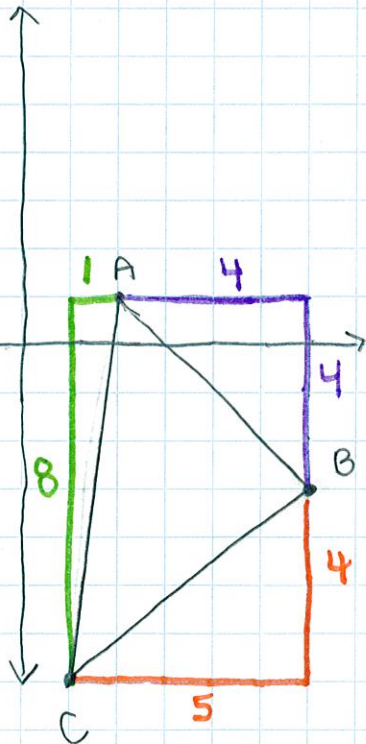
$$X = \sqrt{113}$$

$$X \approx 10.6 \text{ blocks}$$

Each block is $\frac{2}{10}$ of a mile

$$10.6 \left(\frac{2}{10} \right) = 2.12 \text{ miles from start}$$

15.



$$8^2 + 4^2 = C^2$$

$$64 + 16 = C^2$$

$$C^2 = 80$$

$$C = \sqrt{80}$$

$$4^2 + 4^2 = C^2$$

$$16 + 16 = C^2$$

$$C^2 = 32$$

$$C = \sqrt{32}$$

$$4^2 + 5^2 = C^2$$

$$16 + 25 = C^2$$

$$41 = C^2$$

$$C = \sqrt{41}$$

$$P = \sqrt{80} + \sqrt{32} + \sqrt{41}$$

P = put in calc

$$P = 20.12 \text{ units}$$