

Unit 3 Review

****Remember to get your study guides signed for 5 bonus points on your test!****

Jenna's heart rate is 60 beats per minute.

- If this is her average heart rate, how many times will her heart beat in 30 years?

$$\frac{60 \text{ beats}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{24 \text{ hr}}{1 \text{ day}} \cdot \frac{365 \text{ days}}{1 \text{ yr}} \cdot 30 \text{ yrs} = 94608000 \text{ beats}$$
- If Jenna's heart beat 604,800 times, how many full days would have elapsed?

$$\frac{604800 \text{ beats}}{60 \text{ beats}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot \frac{1 \text{ day}}{24 \text{ hr}} = 7 \text{ days}$$
- If Jenna's heart beat 747,533 times, how much time has elapsed?

$$8 \text{ days}, 15 \text{ hours}, \text{ and } 39 \text{ minutes.}$$

** On Test!*

Nov 15-8:43 AM

- A boat has a speed of 36 km/h. What is its speed in m/s? Show all your work!

$$\frac{36 \text{ km}}{1 \text{ hr}} \cdot \frac{1000 \text{ m}}{1 \text{ km}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot \frac{1 \text{ min}}{60 \text{ sec}} = 10 \text{ m/sec}$$
- A car has a speed of 25 m/s. What is its speed in km/h? Show all your work!

$$\frac{25 \text{ m}}{1 \text{ sec}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{1 \text{ km}}{1000 \text{ m}} = 90 \text{ km/h}$$

** MC on Test!*

Nov 15-8:46 AM

Light travels 186,282 miles per second

- How many miles will light travel in one year? (Use 365 days in a year)

$$\frac{186282 \text{ m}}{1 \text{ sec}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{24 \text{ hr}}{1 \text{ day}} \cdot \frac{365 \text{ days}}{1 \text{ yr}} = 5874589152000 \text{ mi/yr}$$
- Capella is the 6th brightest star in the sky and is 41 lightyears from earth. How many miles will light travel in its way to earth?

$$41 \text{ yrs} \cdot 5874589152000 \text{ mi/yr} = 240858155200000 \text{ mi}$$
- Neptune is 2,798,842 miles from the sun. How many hours does it take light to travel from the sun to Neptune?

$$\frac{2798842 \text{ mi}}{186282 \text{ mi}} \cdot \frac{1 \text{ min}}{60 \text{ sec}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = 0.004 \text{ hrs}$$

** One on Test*

Nov 15-8:46 AM

- What is the area of a 42" TV if the length to height ratio is 16:9?

$$\left(\frac{16}{9}L\right)^2 + L^2 = (42)^2$$

$$0.32L^2 + L^2 = 1764$$

$$1.32L^2 = 1764$$

$$L^2 = 1336.36 \leftarrow L = 36.56$$

$$A = (36.56)(20.57) = 752.04$$
- What is the area of a 65" TV if the length to height ratio is 16:9?

$$\left(\frac{16}{9}L\right)^2 + L^2 = (65)^2$$

$$0.32L^2 + L^2 = 4225$$

$$1.32L^2 = 4225$$

$$L^2 = 3201$$

$$L = 56.58$$

$$A = (56.58)(31.93) = 1800.94$$
- How much more area does the 65" TV have than the 42" TV?

$$65" A = 1800.94$$

$$42" A = 752.04$$

$$* 752.04 \times 2 = 1504.08$$

The 65" TV has more than twice the area (screen space) than the 42" TV.

Nov 15-8:47 AM

Find the area and perimeter for the following shapes.

- Total Area = 144 mm²
Perimeter = 60 mm
- Total Area = 89 in²
Total Perimeter = 30 + 6√2 in
- Total Perimeter = 68 + √130 m
Total Area = 247.5 m²
- Perimeter = 48 + 2a in
Area = 24a in²

Nov 15-8:48 AM

- A rectangle has an area of 2,130" and a width of 30". What is the perimeter of the rectangle?

$$A = L \cdot w$$

$$\frac{2130}{30} = \frac{L \cdot 30}{30}$$

$$71 = L$$

$$P = 2L + 2w$$

$$= 2(71) + 2(30)$$

$$P = 202"$$
- Find the length of all the sides of the triangle given that the perimeter is 52 mm.

$$P = \text{side} + \text{side} + \text{side}$$

$$P = (x) + (3x+1) + (2x+3)$$

$$52 = 6x + 4$$

$$-4$$

$$\frac{48}{6} = \frac{4x}{6}$$

$$8 = x$$

Nov 15-8:48 AM

18. Can you change the area of a rectangle without changing its perimeter? How?

Yes ~ by changing the dimensions of the rectangle.



19. What type of rectangle will always produce the largest area given the same perimeter?

Square!

Nov 15-8:50 AM

20. Given the points A(-4, -1), B(-2, -5), C(4, -2), and D(2, 2), determine the type of quadrilateral by proving or disproving algebraically that the following statements. Use the following formulas to help you.

Distance Formula:
 $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Slope Formula:
 $m = \frac{y_2 - y_1}{x_2 - x_1}$

Rectangle!

$AB = 4.5 = \sqrt{(-2+4)^2 + (-5+1)^2}$
 $CD = 4.5 = \sqrt{(4-2)^2 + (-2-2)^2}$

- All 4 sides are congruent. $AD = 6.7 = \sqrt{(2+4)^2 + (2+1)^2}$
 $BC = 6.7 = \sqrt{(4+2)^2 + (-2+5)^2}$
 Not a Square. Diagonals are perpendicular.
- Adjacent sides are perpendicular. True ~ Right Angles.
- Opposite sides are parallel. True ~ a type of parallelogram.
- Opp. Sides are Congruent.

AD: $m = \frac{1}{2}$ $\frac{2+1}{2+4} = \frac{3}{6}$	BC: $m = \frac{1}{2}$ $\frac{-2+5}{4+2} = \frac{3}{6}$
AB: $m = -2$ $\frac{-5+1}{-2+4} = \frac{-4}{2}$	CD: $m = -2$ $\frac{-2-2}{4-2} = \frac{-4}{2}$

Nov 15-8:51 AM

Mathematically determine if the following statements are true or not. If not, rewrite them so that they are true.

21. A Medium pizza has a diameter of 12 inches and a personal pizza has a diameter of 4 inches. You can get the same amount of pizza from 9 small pizzas as you from 1 medium pizza.

Area of Circle: πr^2
 Medium: 36π
 Personal: 4π $\times 9!$

False

$9 \text{ small} = 1 \text{ medium}$

22. If the price of the personal pizza is \$3, what is a "fair price" for the medium pizza based on your answer for #19?

$\$3 \times 9 = \27

Nov 15-8:51 AM

Mathematically determine if the following statements are true or not. If not, rewrite them so that they are true.

23. If you double the radius of a circle, then you double its circumference.

$2\pi r = C$ ✓ $2C = 2\pi 2r$
 $2C = 4\pi r$
 True

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* Circumference: $2\pi r$

24. If you double the radius of a sphere, then you double its volume.

$V = \frac{4}{3}\pi r^3$ $2V = \frac{4}{3}\pi (2r)^3$
 $= \frac{4}{3}\pi 8r^3$ ← simplify: $\frac{2V}{2} = \frac{4}{3}\pi 8r^3$
 X False

* Volume of Sphere: $\frac{4}{3}\pi r^3$

25. If you triple the length, width, and height of a rectangular prism, then you will also triple its volume.

* Volume = $L \cdot w \cdot h$

$3V = 3L \cdot 3w \cdot 3h$

$3V \neq 27(L \cdot w \cdot h)$ False

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

Nov 15-8:52 AM