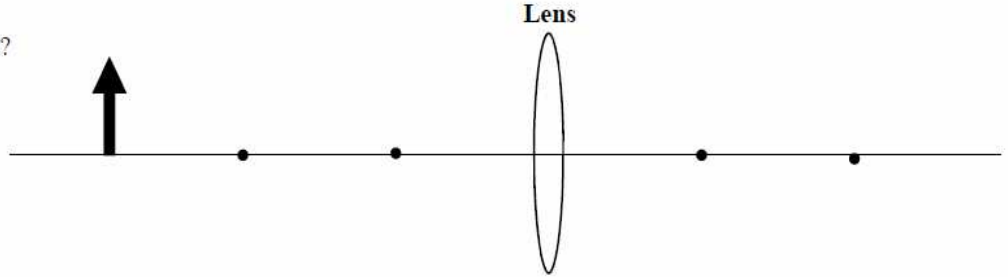


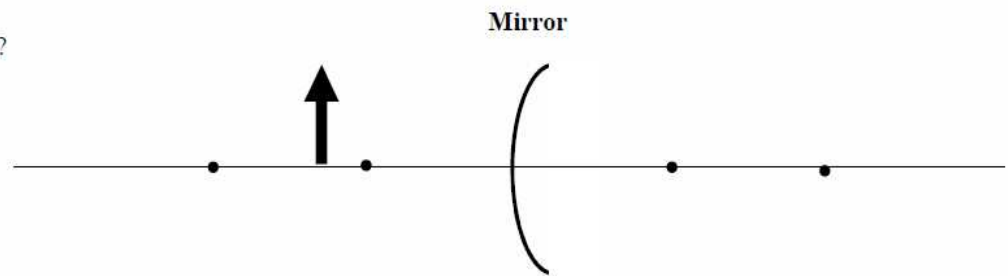
Name: \_\_\_\_\_  
 Period: \_\_\_\_\_

**Light and Optics In Class Review 1**

1. A. Concave or convex?
- B. Convergent or divergent?
- C. Is  $f$  + or -?
- D. Draw the ray diagram.
- E. Is the image magnified or reduced?
- F. Is the image real or virtual?



2. A. Concave or convex?
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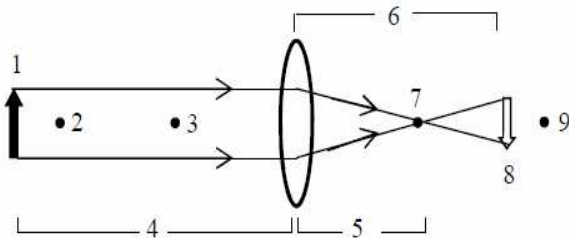
3. Is light a wave or a particle? Prove your answer.	10. A. More energy: Microwaves or X-rays? B. Shorter wavelength: gamma rays or radio waves? C. Faster speed: green light or radio waves? D. Higher frequency: gamma rays or visible light? E. Less energy: red light or blue light?
4. Where does light come from?	11. Light is a transverse wave. Does light vibrate parallel or perpendicular to the motion of the wave?
5. Why did the phosphorous pad (glow-in-the-dark) glow lime green regardless of the light that we shined on it?	12. As a wave, what moves thru the air as light travels: the air particles or the light energy?
6. Make the following additive colors using RGB.	13.
Cyan _____      White _____      Yellow _____	14.
Red _____      Magenta _____      Black _____	15. Calculate the speed of 1,200 m microwaves.
8. A. What colors does Magenta reflect? B. What color does magenta absorb?	16. If it takes the sun's light 8 minutes to reach the earth, calculate the time it would take a satellite to send its radio signals back to NASA if it is the same distance from the earth as the sun.
9. What color does Cyan absorb?	

17. Fill in this table.	Convergent or Divergent?	Magnifies or Reduces?	+ or - f?	Which side is real?
Concave Lens				
Convex Lens				
Concave Mirror				
Convex Mirror				

18. Are the following + or -?

\_\_\_ q if image is inverted.  
 \_\_\_ h  
 \_\_\_ h' if the image is upright  
 \_\_\_ M if the image is upright  
 \_\_\_ h' if the image is on the right side of a mirror  
 \_\_\_ M if the image is virtual

\_\_\_ q if the image is on the left side of a lens  
 \_\_\_ h' if the image is on the right side of a lens.  
 \_\_\_ q if the image is on the left side of a mirror.  
 \_\_\_ M if the image is real.



19. Identify the parts of the diagram above.

- A. The object: \_\_\_\_.  
 B. Radius of curvature: \_\_\_\_.  
 C. The focal point: \_\_\_\_.  
 D. q: \_\_\_\_.  
 E. p: \_\_\_\_.  
 F. f: \_\_\_\_.  
 G. The image: \_\_\_\_

20. A 4 cm object is in front of a convex mirror with a 3 cm focal length. The image is 2 cm to the right of the mirror.

- A) Is this mirror convergent or divergent?  
 B) Is f + or - for this mirror?  
 C) Find where the object is.

D) Find the height of the image.

E) Find the magnification of the mirror.

F) Is the image real or virtual?

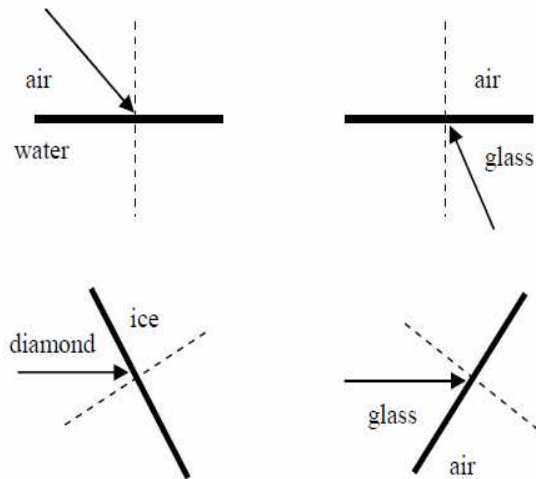
21. The object is placed between the focal length and center of curvature of a convex lens.

- A) Where will the image be?  
 B) Will the image be real or virtual?  
 C) Will the image be magnified or reduced?

22. Why does light refract?

23. How can you decide which way light will refract?

24. Draw what will happen for the following situations.



25. Find the speed of light in a diamond.

26. Light travels thru a substance at  $1.6 \times 10^8$  m/s. What is the index of refraction for this substance?

27. Two substances: A ( $n = 1.65$ ); B ( $n = 2.44$ ).  
 A. In which substance will light travel slower?  
 B. In which substance will light refract more from air?

28. A ray of light is going  $15^\circ$  in water. At what angle will it be going when it passes into air?