



GREATER ATLANTA CHRISTIAN SCHOOL

AP Physics C Summer Review

This packet is intended to be review of some fundamental math and science concepts. Students enrolled in AP Physics C for the Fall should thoroughly complete this review over the summer to turn in on the first day of school. Students will be formally assessed on this material during the first few days of the new school year.

Multiple Choice

1. The number of significant figures in 15.0 is
A. 1 B. 2 C. 3 D. 4 E. 5
2. The average speed of a moving object during a given interval of time is always:
A. the magnitude of its average velocity over the interval.
B. the distance covered during the time interval divided by the time interval.
C. one-half its speed at the end of the interval.
D. its acceleration multiplied by the time interval.
E. one-half its acceleration multiplied by the time interval.
3. Two automobiles are 150 kilometers apart and traveling toward each other. One automobile is moving at 60km/h and the other is moving at 40km/h mph. In how many hours will they meet?
A. 2.5. B. 2.0. C. 1.75 D. 1.5 E. 1.25

4. A car starts from Hither, goes 50 km in a straight line to Yon, immediately turns around, and returns to Hither. The time for this round trip is 2 hours. The magnitude of the average velocity of the car for this round trip is:
- A. 0 B. 50 km/hr. C. 100 km/hr. D. 200 km/hr.
E. cannot be calculated without knowing the acceleration
5. A racing car traveling with constant acceleration increases its speed from 10m/s to 50m/s over a distance of 60m. How long does this take?
- A. 2.0 s B. 4.0 s C. 5.0 s D. 8.0 s E. 10.0 s
6. A car starts from rest and goes down a slope with a constant acceleration of 5.0 m/s^2 . After 5 s the car reaches the bottom of the hill. Its speed at the bottom of the hill is:
- A. 1 m/s B. 12.5 m/s. C. 25 m/s D. 50 m/s E. 160 m/s
7. A car moving with an initial velocity of 25 m/s north has a constant acceleration of 3 m/s^2 south. After 6 seconds, its velocity will be:
- A. 7 m/s north B. 7 m/s south C. 43 m/s north
D. 20 m/s north E. 20 m/s south
8. When adding two vectors, the magnitude of the resultant vector must always be
- A. zero B. between the difference and sum of the two magnitudes C. the sum of the two magnitudes of each vector
D. the hypotenuse of the two vectors E. the difference of the two magnitudes of each vector

For Problems 9-10, we are given:

mass in kilograms (kg)

distance or radius in meters (m)

time in seconds (sec)

All units are MKS

$$P = W/t \quad W = Fd \quad v = d/t \quad I = (1/2)mr^2 \quad a = v/t \quad F = ma$$

$$\mu = (\text{force applied})/\text{force normal}$$

9. Solve for G and give units for G (show work)

$$F = (Gm_1m_2)/d^2$$

10. Show units for each of the following:

(a) F/v

(b) Ft

(c) F/a

(d) F/W

(e) v^2/a

(f) mv

(g) P/a

(h) Wt/d

(i) I/r

(j) Ft^2/m

11. For each of the following, solve for “a”

(a) $(mb)/c = r[\sqrt{a}]$

(b) $apm = (ca^2)/4$

(c) $f/a^2 = n\sin\Theta$

$$(d) v/(arp) = (6n^2)/(ba^2)$$

$$(e) r\sin(a) = 2/(pb)$$

$$(f) (abc)/(\sqrt{d}) = (\sqrt{nd})/6$$

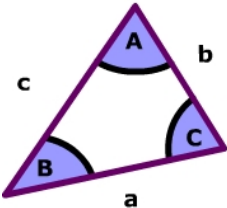
$$(g) 6a^2 + 2a - 3 = 0$$

$$(h) a^2 + b^2 - 2ab \cos\Theta = c^2$$

$$(i) n/(2a) = d/(b\sin\Theta)$$

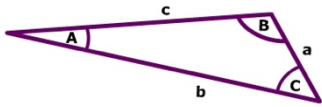
$$(j) (rw)/4 = xa$$

Law of Cosines


$$a^2 = b^2 + c^2 - 2bc \cdot \cos(A)$$
$$b^2 = a^2 + c^2 - 2ac \cdot \cos(B)$$
$$c^2 = a^2 + b^2 - 2ab \cdot \cos(C)$$

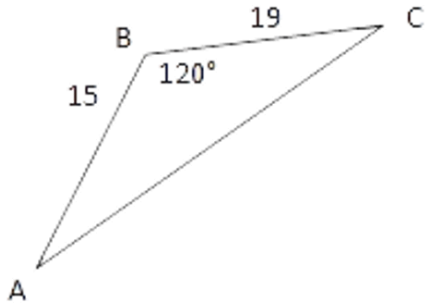
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Law of Sines

$$\frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$$

$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)}$$

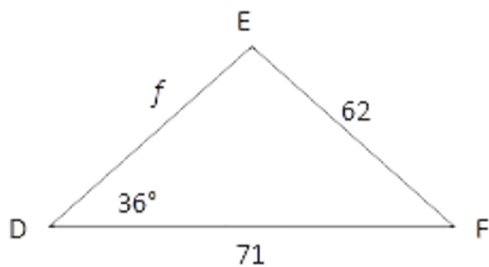
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12. Find the $m\angle C$ to the nearest whole degree.



13. If a $25^\circ, 45^\circ, 110^\circ$ triangle with the leg between the 25° angle and the 45° angle measures 56 cm. find the length of the other two sides. Draw a to-scale sketch of your triangle.

14. Find the f to the nearest whole number.



15. An airplane going 250 mph is heading due north when it encounters a wind of 60 mph 30 degrees east of north. Sketch the situation – label the pieces – determine the resultant angle and speed of the plane.

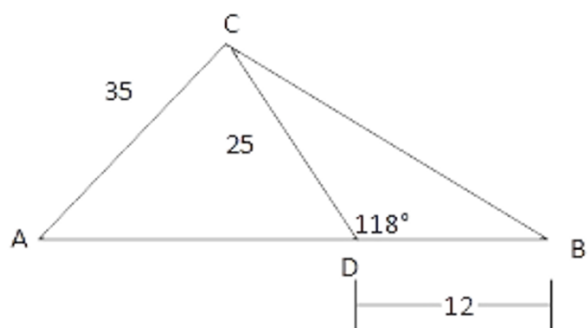
16. Using the concept from Problem 15, what direction would the wind need to be blowing for the final speed of the plane to be 310 mph?

and what direction would the wind need to be blowing for the speed of the plane to be 190 mph?

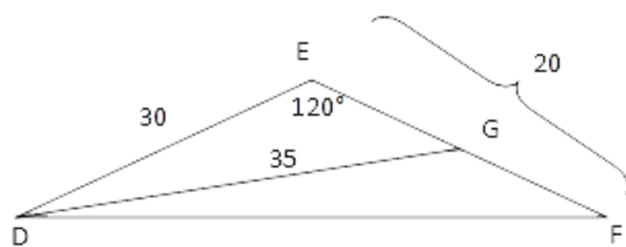
and what direction would the wind need to be blowing for the plane to be going 275 mph?

and why can the plane not ever be going 400 mph under the conditions given?

17. Find the $m\angle A$ to the nearest whole degree.



18. Find the $m\angle DGF$ to the nearest whole degree.



For the following exercises, solve each system by substitution.

19.

$$x+3y=52$$

$$x+3y=4$$

20..

$$3x-2y=185$$

$$x+10y=-10$$

21.

$$4x+2y=-10$$

$$3x+9y=0$$

22.

$$2x+4y=-3$$

$$0.89x-5y=1.3$$

23.

$$-2x+3y=1.2$$

$$-3x-6y=1.8$$

24.

$$x-0.2y=1$$

$$-10x+2y=5$$

25.

$$3x+5y=930$$

$$x+50y=-90$$

26.

$$-3x+y=21$$

$$2x-4y=-8$$

27.

$$12x+13y=16$$

$$16x+14y=91$$

28.

$$-14x+32y=11$$

$$-18x+13y=3$$

For the following exercises, solve each system by addition.

29.

$$-2x+5y=-42$$

$$7x+2y=30$$

30.

$$6x-5y=-34$$

$$2x+6y=46x$$

31.

$$5x-y=-2.6$$

$$-4x-6y=1.45$$

32.

$$7x - 2y = 34$$

$$x + 5y = 3.25$$

33.

$$-x + 2y = -15$$

$$x - 10y = 6$$

34.

$$7x + 6y = 2$$

$$-28x - 24y = -87$$

35.

$$56x + 14y = 18$$

$$x - 12y = -4312056$$

36.

$$13x + 19y = 29$$

$$-12x + 45y = -1313$$

For the following exercises, solve each system by any method.

37.

$$5x + 9y = 16$$

$$x + 2y = 45$$

38.

$$6x - 8y = -0.6$$

$$3x + 2y = 0.96$$

39.

$$5x - 2y = 2.25$$

$$7x - 4y = 35$$

40.

$$x - 512y = -5512$$

$$-6x + 52y = 552$$

Graphical

For the following exercises, graph the system of equations and state whether the system is consistent, inconsistent, or dependent and whether the system has one solution, no solution, or infinite solutions.

41.

$$3x - y = 0.6$$

$$x - 2y = 1.33$$

42.

$$-x + 2y = 4$$

$$2x - 4y = 1$$