

Group Quiz E-G

1. What is the gravitational force on a 3.40 kg mass in a gravitational field with a strength of 9.81 N/kg?

1		2		3		4	
33.4	N/kg	1.07E+04	N/C left	1.61	N/kg	1.16E-14	N right
3.4		1.40E-04		3.2		72100	
9.81		1.5		5.15		1.60E-19	

2. A $-140. \mu\text{C}$ charge experiences a force of 1.50 N to the right. What is the magnitude and direction of the electric field?

1		2		3		4	
33.4	N/kg	1.07E+04	N/C left	1.61	N/kg	1.16E-14	N right
3.4		1.40E-04		3.2		72100	
9.81		1.5		5.15		1.60E-19	

3. A 3.20 kg mass on the moon experiences a force of 5.15 N. What is the gravitational field strength on the moon?

1		2		3		4	
33.4	N/kg	1.07E+04	N/C left	1.61	N/kg	1.16E-14	N right
3.4		1.40E-04		3.2		72100	
9.81		1.5		5.15		1.60E-19	

4. A 72,100 N/C electrical field to the right exerts what force on a proton? (Force and direction)

1		2		3		4	
33.4	N/kg	1.07E+04	N/C left	1.61	N/kg	1.16E-14	N right
3.4		1.40E-04		3.2		72100	
9.81		1.5		5.15		1.60E-19	

5. A proton accelerates North at $9.58 \times 10^8 \text{ m/s/s}$. What is the magnitude and direction of the electric field?

5		6		7		8
10.0	N/C North	5.57E+13	m/s/s East	2.81E+04	N/C Left	3.06
9.58E+08		317		0.82		1.25E+04
1.67E-27		9.11E-31		2.10E-06		1.30E-05
1.60E-19		1.60E-19		8.99E+09		8.99E+09

6. An electron is in a 317 N/C electric field to the West. What is the magnitude and direction of its acceleration?

5		6		7		8
10.0	N/C North	5.57E+13	m/s/s East	2.81E+04	N/C Left	3.06
9.58E+08		317		0.82		1.25E+04
1.67E-27		9.11E-31		2.10E-06		1.30E-05
1.60E-19		1.60E-19		8.99E+09		8.99E+09

7. What is the electrical field 82.0 cm to the right of a $-2.10\text{ }\mu\text{C}$ charge? (Magnitude and direction)

5		6		7		8
10.0	N/C North	5.57E+13	m/s/s East	2.81E+04	N/C Left	3.06
9.58E+08		317		0.82		1.25E+04
1.67E-27		9.11E-31		2.10E-06		1.30E-05
1.60E-19		1.60E-19		8.99E+09		8.99E+09

8. Where is the electrical field $1.25 \times 10^4 \text{ N/C}$ straight up in the proximity of a $13.0 \text{ }\mu\text{C}$ charge. (Location and distance)

5		6		7		8
10.0	N/C North	5.57E+13	m/s/s East	2.81E+04	N/C Left	3.06
9.58E+08		317		0.82		1.25E+04
1.67E-27		9.11E-31		2.10E-06		1.30E-05
1.60E-19		1.60E-19		8.99E+09		8.99E+09

9. I am 2.15 m to the left of an unknown charge, and there is an electric field of $1.65 \times 10^5 \text{ N/C}$ to the right. What is the magnitude and polarity of the charge? (How many C, and is it + or -)

9		10a		10b		11		12	
-8.48E-05	C (negative)	3.12	N/kg	34.8	N/kg right	4.00	m (we are to its left)	7.29E+12	kg the field is to the left
2.15		1.60E+23		3.5		5		15	
1.65E+05		1.85E+06		6.40E+12		2.08E-11		2.16	
8.99E+09		6.67E-11		6.67E-11		6.67E-11		6.67E-11	

10a. What is the gravitational field on the surface of a planet with a mass of 1.60×10^{23} kg, and a radius of 1.85×10^6 m?

9		10a		10b		11		12	
-8.48E-05	C (negative)	3.12	N/kg	34.8	N/kg right	4.00	m (we are to its left)	7.29E+12	kg the field is to the left
2.15		1.60E+23		3.5		5		15	
1.65E+05		1.85E+06		6.40E+12		2.08E-11		2.16	
8.99E+09		6.67E-11		6.67E-11		6.67E-11		6.67E-11	

10b. What is the gravitational field 3.50 m to the left of a (very dense) mass of 6.40×10^{12} kg? (Magnitude and direction)

9		10a		10b		11		12	
-8.48E-05	C (negative)	3.12	N/kg	34.8	N/kg right	4.00	m (we are to its left)	7.29E+12	kg the field is to the left
2.15		1.60E+23		3.5		5		15	
1.65E+05		1.85E+06		6.40E+12		2.08E-11		2.16	
8.99E+09		6.67E-11		6.67E-11		6.67E-11		6.67E-11	

11. Where in the proximity of a 5.00 kg shot put is the gravitational field 2.08×10^{-11} N/kg to the right? (Location and distance)

9		10a		10b		11		12	
-8.48E-05	C (negative)	3.12	N/kg	34.8	N/kg right	4.00	m (we are to its left)	7.29E+12	kg the field is to the left
2.15		1.60E+23		3.5		5		15	
1.65E+05		1.85E+06		6.40E+12		2.08E-11		2.16	
8.99E+09		6.67E-11		6.67E-11		6.67E-11		6.67E-11	

12. I am 15.0 m to the right of an unknown mass and there is a gravitational field of 2.16 N/kg due to the mass. Which direction is the field, and what is the mass?

9		10a		10b		11		12	
-8.48E-05	C (negative)	3.12	N/kg	34.8	N/kg right	4.00	m (we are to its left)	7.29E+12	kg the field is to the left
2.15		1.60E+23		3.5		5		15	
1.65E+05		1.85E+06		6.40E+12		2.08E-11		2.16	
8.99E+09		6.67E-11		6.67E-11		6.67E-11		6.67E-11	

13. Find the gravitational field at p and q:



$3.40 \times 10^6 \text{ m}$

(p)

$5.10 \times 10^6 \text{ m}$



$3.60 \times 10^6 \text{ m}$

(q)

$1.20 \times 10^{24} \text{ kg}$

$9.40 \times 10^{24} \text{ kg}$

p = _____

q = _____

A	1.20E+24	3.40E+06		
B	9.40E+24	5.10E+06		
G	6.67E-11	3.60E+06		
			gAp	-6.92 left
			gBp	24.11 right
			gp	17.18 N/kg right
			gAq	-0.55 left
			gBq	-48.38 left
			gq	-48.92 N/kg left

14. Find the electric field at p and q:

(p)

12.0 m



+4.50 μC

23.0 m



-5.30 μC

11.0 m

(q)

p = _____

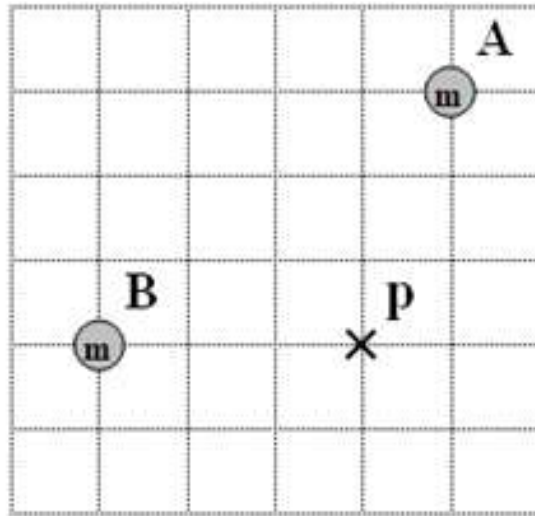
q = _____

A	4.50E-06	12			
B	5.30E-06	23			
K	8.99E+09	11			
			EAp	-280.94	left
			EBp	38.90	right
			Ep	-242.04	(left)
			Eaq	35.00	right
			EBq	-393.78	left
			Eq	-358.78	(left)

A 5x5 grid with a positive charge B at (2,2), a negative charge A at (4,2), and a point P at (3,4). The grid lines are spaced at intervals of 1 unit.

A		3.20E-06				
B		2.40E-06				
K		8.95E+09	Mag	Angle	Dir	X Y
Ea		2,212.92	56.31	(+, -)	1227.509	-1841.263
Eb		2,697.00	45	(+, +)	1907.067	1907.067
					3134.576	65.804
					magn	3135 N/C
					angle	1 20 degrees

16. Find the gravitational field at point p. Draw the gravitational field vector, and label its magnitude and direction. Mass A is 2.50×10^{12} kg, B is 5.10×10^{12} kg, and each grid line is a meter.



A	2.50E+12					
B	5.10E+12					
G	6.67E-11					
		Mag	Angle	Dir	X	Y
		gA 16.68	71.6	(+,+)	5.273	15.819
		gB 37.80	left	(-,0)	-37.80	0
				Sum	-32.524	15.819
					mag	36.2 N/kg
					angle	25.9 degrees