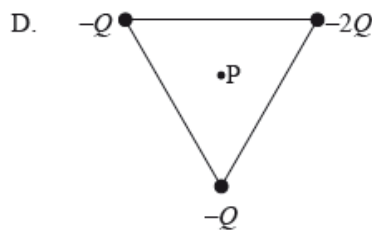
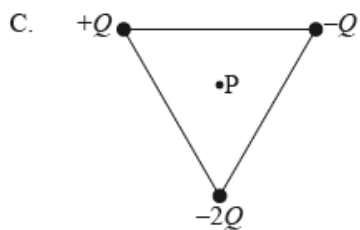
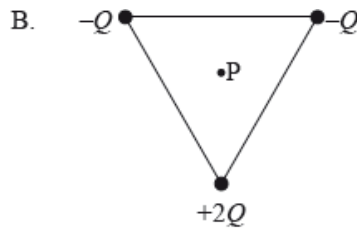
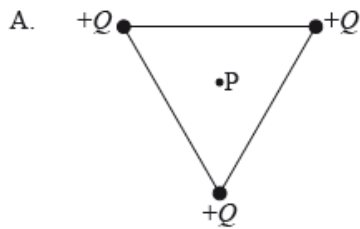


SL Paper 1

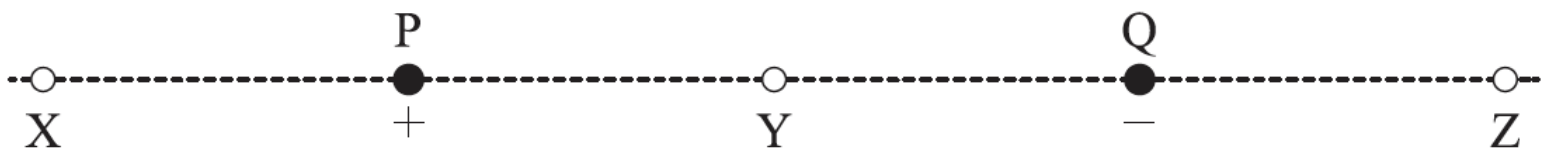
A particle of mass m is a distance R from the surface of Earth of mass M . The force acting on the particle is F . Which of the following is the gravitational field strength at R ?

- A. $\frac{Gm}{R^2}$
- B. $\frac{GmM}{R^2}$
- C. $\frac{F}{m}$
- D. $\frac{F}{M}$

Which arrangement of three point charges at the corner of an equilateral triangle will result in a zero electric field strength at the centre of the triangle, point P?



A positive point charge P and a negative point charge Q of equal magnitude are held at fixed positions. Y is midway between P and Q.



Which of the following gives the direction of the electric field due to the charges at X, Y and Z?

| | X | Y | Z |
|-----------|----------|----------|----------|
| A. | to right | to left | to right |
| B. | to right | to right | to left |
| C. | to left | to right | to right |
| D. | to left | to right | to left |

A point charge of magnitude $2.0 \mu\text{C}$ is moved between two points X and Y. Point X is at a potential of $+6.0 \text{ V}$ and point Y is at a potential of $+9.0 \text{ V}$

. The gain in potential energy of the point charge is

- A. $0.20 \mu\text{J}$.
- B. $1.5 \mu\text{J}$.
- B. $6.0 \mu\text{J}$.
- B. $30 \mu\text{J}$.

The gravitational field strength at a point X in a gravitational field is defined as the force

- A. per unit mass on a mass placed at X.
- B. on a mass placed at X.
- C. per unit mass on a small point mass placed at X.
- D. on a small point mass placed at X.

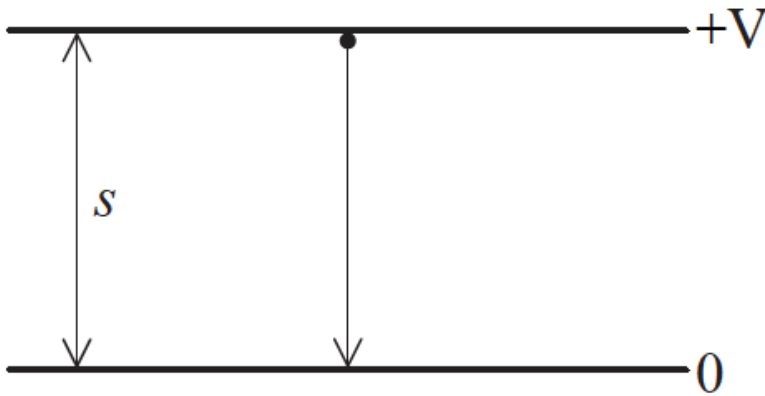
The electric field strength between two oppositely charged parallel plates

- A. has the same value everywhere between the two plates.
- B. decreases from the positive plate to the negative plate.
- C. is larger at the edges than in the center.
- D. is smaller at the edges than in the center.

A particle has charge and mass. Which types of field cause a force to be exerted on the particle when it is moving in the direction of the field?

- A. Electric, gravitational and magnetic fields
- B. Electric and magnetic fields only
- C. Gravitational and magnetic fields only
- D. Electric and gravitational fields only

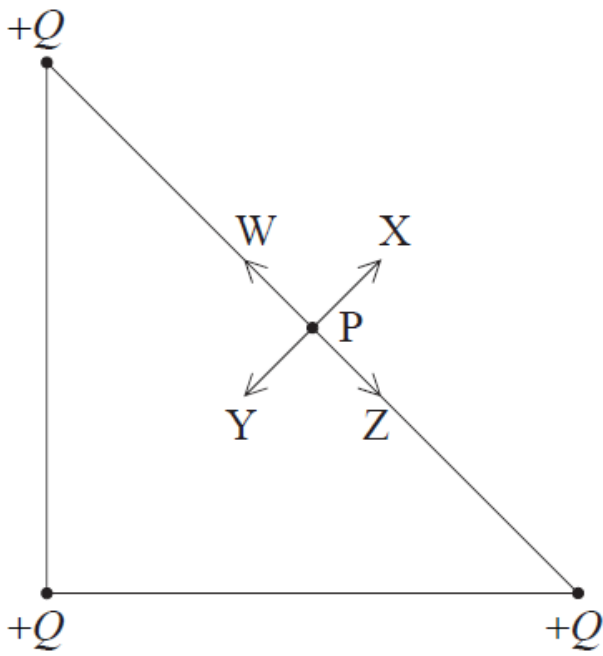
An electron of mass m_e and charge e accelerates between two plates separated by a distance s in a vacuum. The potential difference between the plates is V .



What is the acceleration of the electron?

- A. $\frac{m_e e v}{s}$
- B. $\frac{m_e v}{e s}$
- C. $\frac{e V}{m_e s}$
- D. $\frac{V}{m_e e s}$

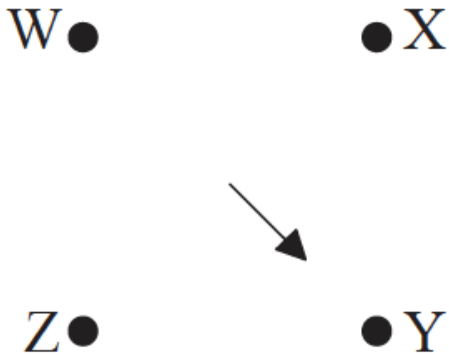
Three positive point charges $+Q$ are fixed in position at the vertices of an isosceles triangle. P is the mid point between two of the charges.



Which arrow correctly identifies the direction of the electric field at point P?

- A. W
- B. X
- C. Y
- D. Z

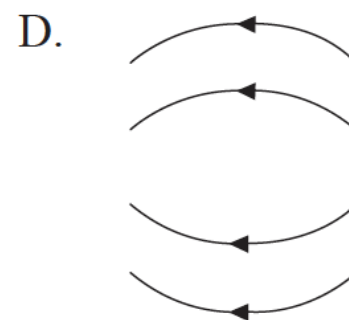
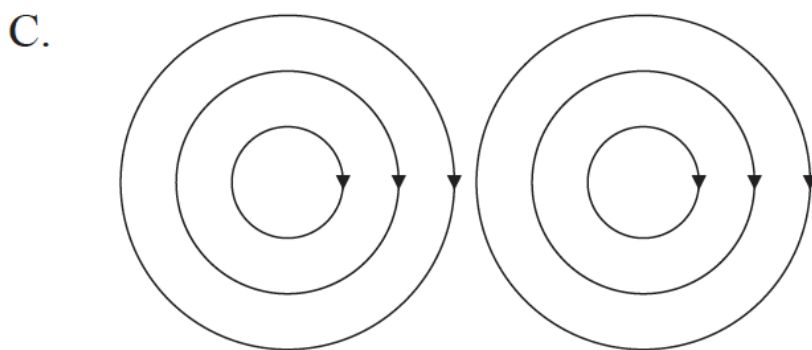
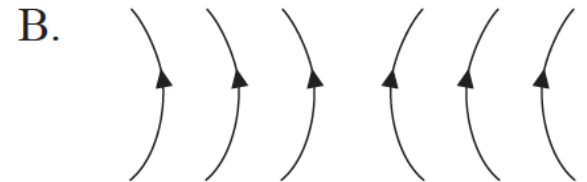
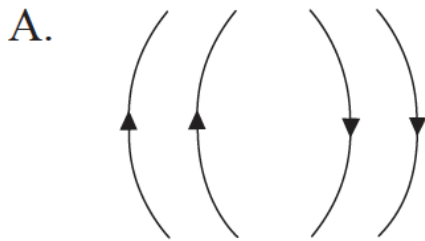
Four point charges of equal magnitude W, X, Y and Z are each fixed to a corner of a square.



W is a positive charge and X is a negative charge. The arrow shows the direction of the resultant electric field at the centre of the square. What are the correct signs of charge Y and of charge Z?

| | Y | Z |
|----|----------|----------|
| A. | positive | positive |
| B. | negative | positive |
| C. | positive | negative |
| D. | negative | negative |

What field pattern can be produced by two point charges?



An electron is held close to the surface of a negatively charged sphere and then released. Which describes the velocity and the acceleration of the electron after it is released?

| | Velocity | Acceleration |
|----|-----------------|---------------------|
| A. | decreasing | constant |
| B. | decreasing | decreasing |
| C. | increasing | constant |
| D. | increasing | decreasing |

Which diagram shows the electric field pattern surrounding two equal positive point charges?

