Coulomb's Law (for a "point" object)
(Force on "point" object B by "point" object A, separated by distance r_{BA})

$$\vec{F}_{BA}^{elec} = \frac{k\, q_A\, q_B}{r_{BA}^2}\, \hat{r}_{BA}$$

Electric Field (for a "point" object)
(Electric field created by "point" object A, at a distance r from object A)

$$\vec{E} = \frac{k\, q_A}{r^2}\, \hat{r}$$

(Both $\hat{r}_{BA}$ and $\hat{r}$ are unit vectors that point directly away from "point" object A – refer back to activity 19.4.2)

Activity 19.8.1 b & c

The spreadsheet is on the class resources page, and is already completed.

- Click on cell B4 to see how the Excel formula matches the equation for the electric field.
- Use the spreadsheet to find the length of the *E*-field vector at each point for each charge. For example, for the *E*-field vector at point #1 by charge B, replace "6.0" under "*r* (cm)"with "6.3" – the *E*-field vector should then be drawn as being 0.45 cm long.
- Use your ruler to draw your *E*-field vectors and follow the instructions for the rest of the activity.

#1

#2

$+2.0 \times 10^{-9} C$

$-2.0 \times 10^{-9} C$

#4

#3

$+2.0 \times 10^{-9}C$

$-2.0 \times 10^{-9}C$

#1

#2

#3

#4

#1

#2

#3

#4

$+2.0 \times 10^{-9}C$

$-2.0 \times 10^{-9}C$

+2.0 × 10⁻⁹C

−2.0 × 10⁻⁹C

#1

#2

#3

#4

+2.0 × 10⁻⁹C

−2.0 × 10⁻⁹C

#1

#2

#3

#4

+2.0 × 10⁻⁹C

−2.0 × 10⁻⁹C

#1

#2

#3

#4

+2.0 × 10⁻⁹C

−2.0 × 10⁻⁹C

#1

#2

#3

#4

#1

#2

+2.0 × 10⁻⁹C

−2.0 × 10⁻⁹C

#4

#3

#1

#2 →

+2.0 × 10^{-9}C

−2.0 × 10^{-9}C

#4

#3

#1

#2

$+2.0 \times 10^{-9}C$

$-2.0 \times 10^{-9}C$

#4

#3

#1

#2

$+2.0 \times 10^{-9}C$

$-2.0 \times 10^{-9}C$

#4

#3

+2.0 × 10⁻⁹C

−2.0 × 10⁻⁹C

#1

#2

#3

#4