

Name: Kelly

$$(x-h)^2 + (y-k)^2 = r^2$$

Equation of a Circle - Skills

1) Find the centre and radius of each of the following circle equations

a) $x^2 + y^2 = 36$

$$(x-0)^2 + (y-0)^2 = 6^2$$

center (0,0) $r=6$

b) $(x+2)^2 + (y+5)^2 = 64$

$$(x-(-2))^2 + (y-(-5))^2 = 8^2$$

Center (-2, -5) $r=8$

c) $(x-4)^2 + (y+7)^2 = 25$

$$(x-4)^2 + (y-(-7))^2 = 5^2$$

center (4, -7) $r=5$

d) $(x-2)^2 + (y-5)^2 = 49$

$$(x-2)^2 + (y-5)^2 = 7^2$$

center (2, 5) $r=7$

e) $(x+3)^2 + y^2 = 16$

$$(x-(-3))^2 + (y-0)^2 = 4^2$$

center (-3, 0) $r=4$

f) $x^2 + y^2 + 10x + 8y - 40 = 0$

$$x^2 + 10x + y^2 + 8y = 40$$

$$(x+5)^2 + (y+4)^2 = 49$$

$$(x-(-5))^2 + (y-(-4))^2 = 7^2$$

center (-5, -4)

$r=7$

2) Find the equation of each circle below in the form $(x-h)^2 + (y-k)^2 = r^2$

a) Centre = (8, 7) Radius = 3

$$(x-8)^2 + (y-7)^2 = 9$$

b) Centre = (-6, 2) Radius = 10

$$(x+6)^2 + (y-2)^2 = 100$$

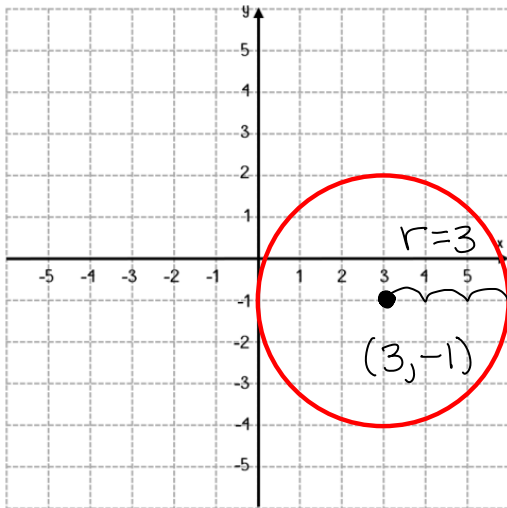
c) Centre = (-3, -5) Radius = 12

$$(x+3)^2 + (y+5)^2 = 144$$

d) Centre = (-0.5, 3) Radius = $\sqrt{3}$

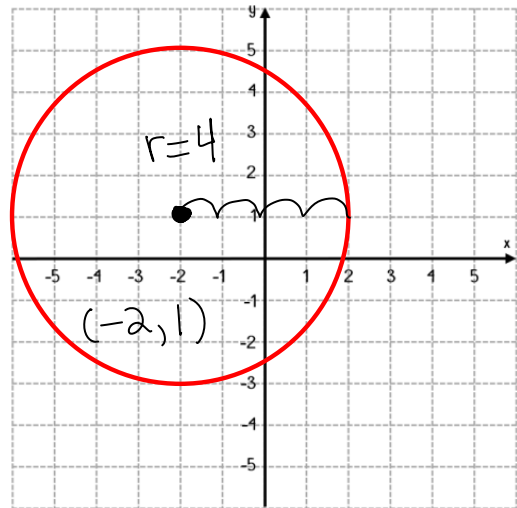
$$(x+0.5)^2 + (y-3)^2 = 3$$

e)



$$(x-3)^2 + (y+1)^2 = 9$$

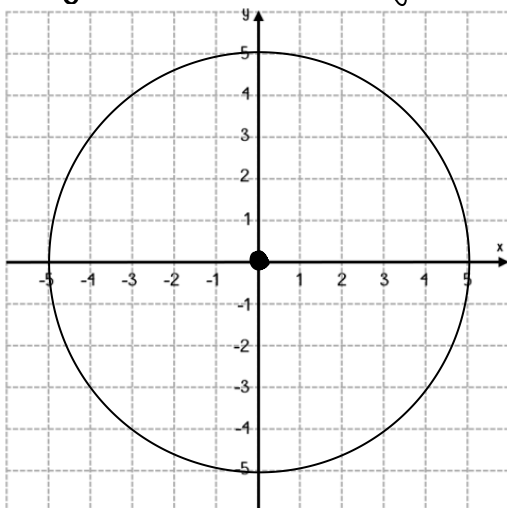
f)



$$(x+2)^2 + (y-1)^2 = 16$$

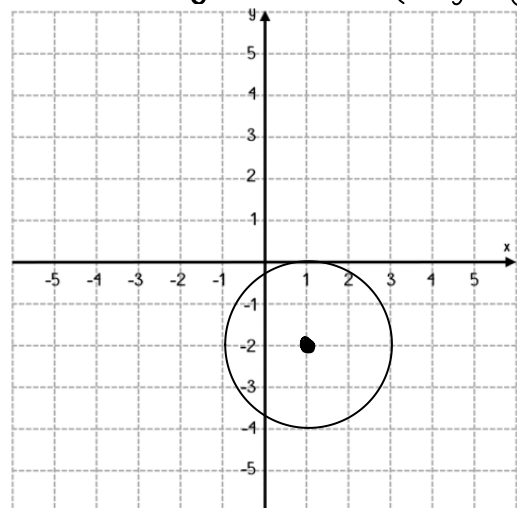
3) Draw the following equations on the on the cartesian grids below

a) $x^2 + y^2 = 25$ $(x-0)^2 + (y-0)^2 = 5^2$



C = (0, 0)
 $r=5$

b) $(x-1)^2 + (y+2)^2 = 4$ $(x-1)^2 + (y-(-2))^2 = 2^2$



C = (1, -2)
 $r=2$

$$\frac{x^2 - x - 6}{x^2 + 7x + 10} \quad D$$

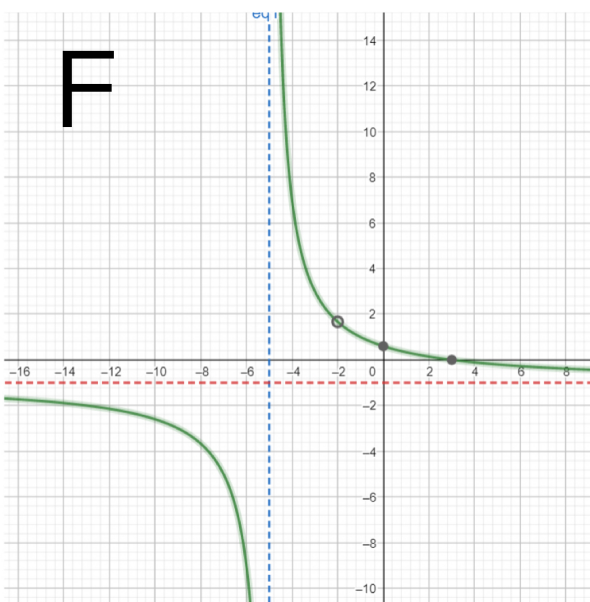
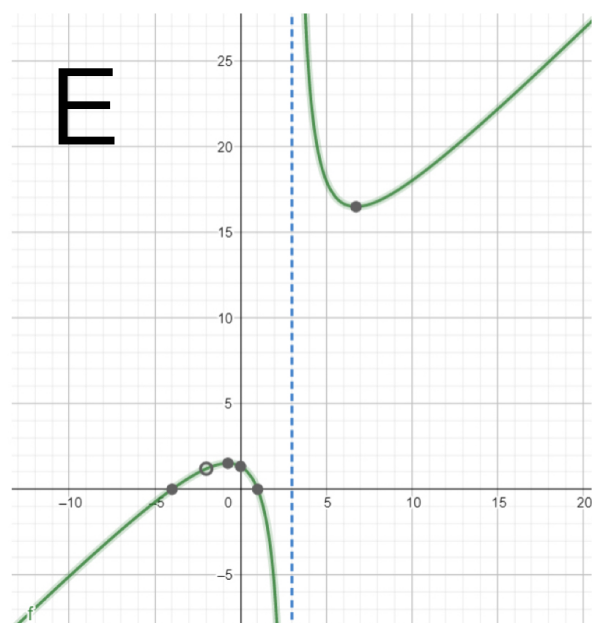
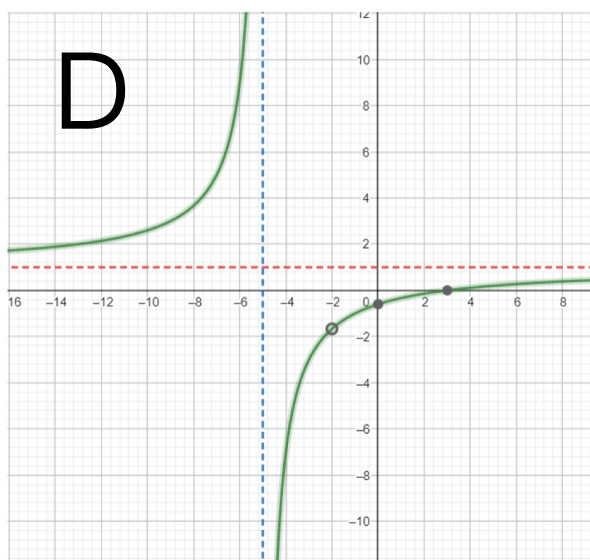
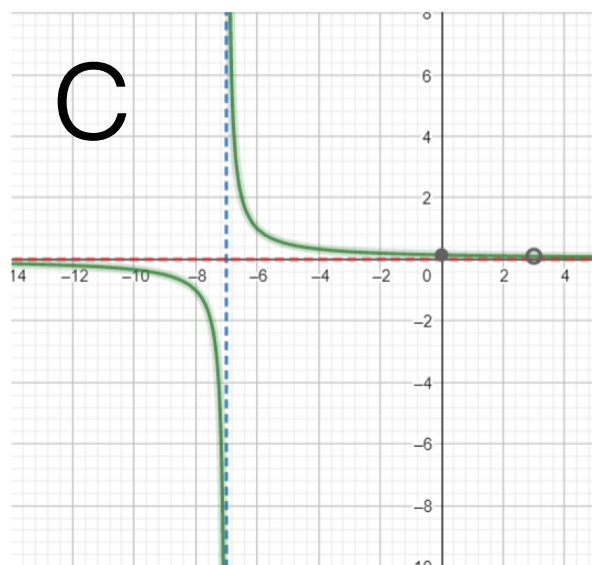
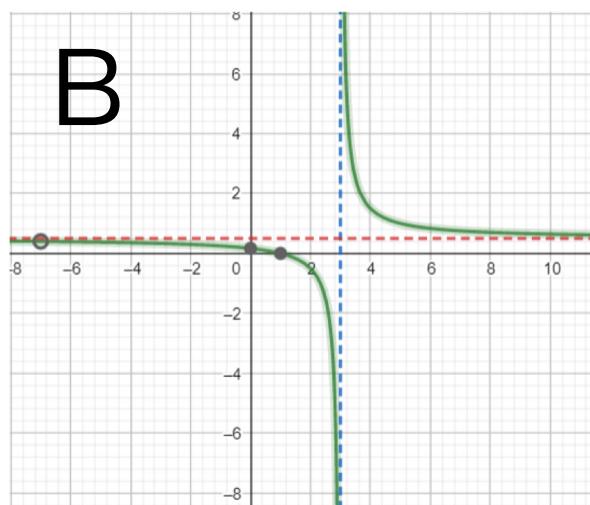
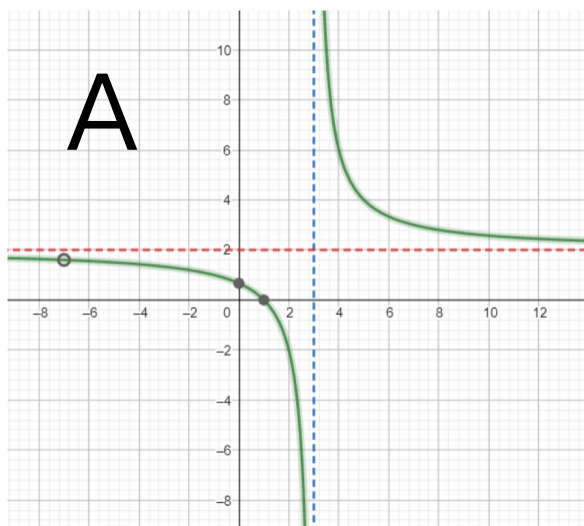
$$\frac{x^2 - x - 6}{-x^2 - 7x - 10} \quad F$$

$$\frac{x^2 + 6x - 7}{2x^2 + 8x - 42} \quad B$$

$$\frac{x - 3}{x^2 + 4x - 21} \quad C$$

$$\frac{(x+2)(x-1)(x+4)}{(x-3)(x+2)} \quad E$$

$$\frac{2x^2 + 12x - 14}{x^2 + 4x - 21} \quad A$$



$$\frac{x^2 - x - 6}{x^2 + 7x + 10}$$

$$x^2 + 7x + 10 = 0$$

$$(x+5)(x+2) = 0$$

$$x = -5 \quad x = -2$$

$$\frac{1}{1} x^2$$

$$y = 1$$

$$\frac{x^2 - x - 6}{x^2 + 7x + 10} = 0$$

$$x = 3$$

$$x = -2$$

$$x^2 - x - 6 = 0$$

$$(x-3)(x+2) = 0$$

$$y = \frac{0^2 - 0 - 6}{0^2 + 7 \cdot 0 + 10} = \frac{-6}{10} = -\frac{3}{5}$$

$$\frac{x^2 - x - 6}{-x^2 - 7x - 10}$$

$$-x^2 - 7x - 10 = 0$$

$$(-x-5)(x+2) = 0$$

$$x = -5 \quad x = -2$$

$$\frac{1}{-1} x^2$$

$$y = -1$$

$$\frac{x^2 - x - 6}{x^2 - 7x - 10} = 0$$

$$x^2 - x - 6 = 0$$

$$(x-3)(x+2) = 0$$

$$y = \frac{0^2 - 0 - 6}{-0^2 - 7 \cdot 0 - 10} = \frac{-6}{-10} = \frac{3}{5} = y$$

$$\frac{x^2 + 6x - 7}{2x^2 + 8x - 42}$$

$$2x^2 + 8x - 42 = 0$$

$$(2x+14)(x-3) = 0$$

$$x = -7 \quad x = 3$$

$$\frac{1}{2} x^2$$

$$y = \frac{1}{2}$$

$$y = \frac{x^2 + 6x - 7}{2x^2 + 8x - 42} = 0$$

$$x^2 + 6x - 7 = 0$$

$$(x+7)(x-1) = 0$$

$$x = -7 \quad x = 1$$

$$y = \frac{0^2 + 6 \cdot 0 - 7}{2 \cdot 0^2 + 8 \cdot 0 - 42} = \frac{-7}{-42} = \frac{1}{6} = y$$

$$\frac{x-3}{x^2 + 4x - 21}$$

$$x^2 + 4x - 21 = 0$$

$$(x+7)(x-3) = 0$$

$$x = -7 \quad x = 3$$

$$\frac{x^1}{x^2}$$

$$y = 0$$

$$y = 0 = \frac{x-3}{x^2 + 4x - 21}$$

$$0 = x-3 \quad x = 3$$

$$\text{no x-intercept}$$

$$y = \frac{0-3}{0^2 + 4 \cdot 0 - 21} = \frac{-3}{-21} = \frac{1}{7} = y$$

$$\frac{(x+2)(x-1)(x+4)}{(x-3)(x+2)}$$

$$(x-3)(x+2) = 0$$

$$x = 3 \quad x = -2$$

$$\frac{x \cdot x \cdot x}{x \cdot x} \frac{x^3}{x^2} \quad 3 > 2$$

no asymptote

$$y = 0 = \frac{(x+2)(x-1)(x+4)}{(x-3)(x+2)}$$

$$0 = (x+2)(x-1)(x+4)$$

$$x = -2 \quad x = 1 \quad x = -4$$

$$\frac{2x^2 + 12x - 14}{x^2 + 4x - 21}$$

$$x^2 + 4x - 21 = 0$$

$$(x+7)(x-3) = 0$$

$$x = -7 \quad x = 3$$

$$\frac{2}{1} x^2$$

$$y = 2$$

$$y = \frac{(0+2)(0-1)(0+4)}{(0-3)(0+2)}$$

$$y = \frac{2(-1)4}{(-3)2} = \frac{-8}{-6} = \frac{4}{3}$$

intercepts-

$$0 = \frac{2x^2 + 12x - 14}{x^2 + 4x - 21}$$

$$0 = 2x^2 + 12x - 14$$

$$(2x-2)(x+7) = 0$$

$$x = 1 \quad x = -7$$

$$y = \frac{2 \cdot 0^2 + 12 \cdot 0 - 14}{0^2 + 4 \cdot 0 - 21} = \frac{-14}{-21} = \frac{2}{3}$$