



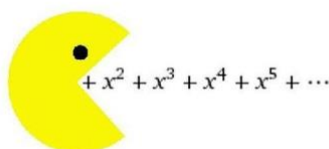
SWINBURNE
SENIOR SECONDARY COLLEGE

Maths Methods

HOLIDAY HOMEWORK

Year 12, 2020

Polynom-nom-nom-nomial



Teacher(s)/Subject Coordinator:	Paul Walters paul.walters@sssc.vic.edu.au
Work required in preparation for start of 2020:	<p>Please complete the following questions from Chapter 1 of the Essential Maths Text book</p> <p>1A Q1, 4, 5, 7, 8</p> <p>1B Q1, 2 LHS, 4, 5, 9 LHS, 11, 15</p> <p>1C Q1, 2, 5, 6, 8, 10, 12, 14</p> <p>Please complete the functions booklet attached to this sheet (Note: This content will be covered during transition. If you were unable to attend please use Chapter 3 of the textbook to complete fill in the blanks.)</p>
Textbooks and other resources:	Cambridge Mathematical Methods Units 3 & 4 CAS Calculator (Ti-Nspire or Casio)
Key Links:	https://www.vcaa.vic.edu.au/Pages/vce/studies/mathematics/cas/casexams.aspx https://www.vcaa.vic.edu.au/Documents/vce/mathematics/MathematicsSD-2016.pdf
Due date:	Friday 7 th of February 2019



MATHEMATICAL METHODS UNITS 3 & 4

FUNCTIONS & TRANSFORMATIONS

TRANSITION WORKSHEETS

FUNCTIONS - A SUMMARY

① LINEAR

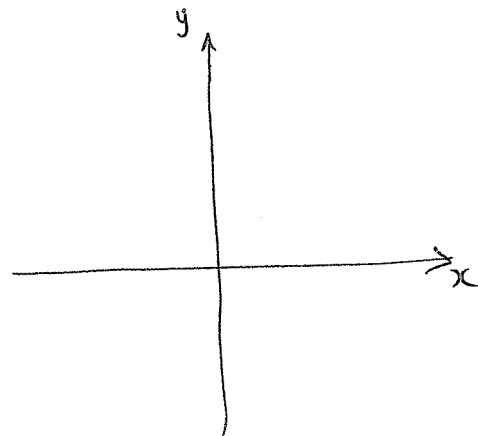
$$y =$$

where $m =$

$c =$

to find the yintercept, let $x =$

to find the xintercept, let $y =$



② QUADRATIC

general form: $y =$

factorised form: $y =$

where xintercepts are

turning point

form: $y =$

where the turning point is $(,)$

(may have to complete the square)

Quadratic Formula

Solve $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

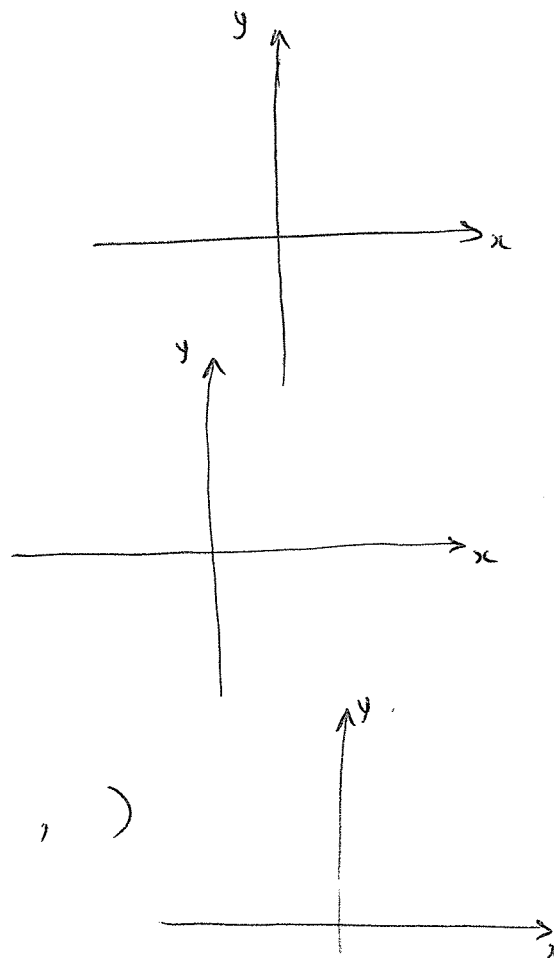
to find the xintercepts

$$b^2 - 4ac > 0$$

$$b^2 - 4ac = 0$$

$$b^2 - 4ac < 0$$

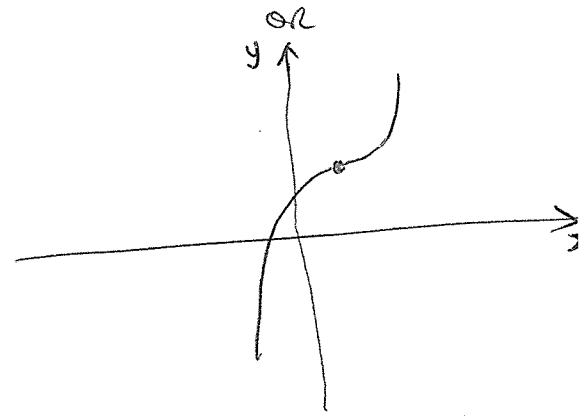
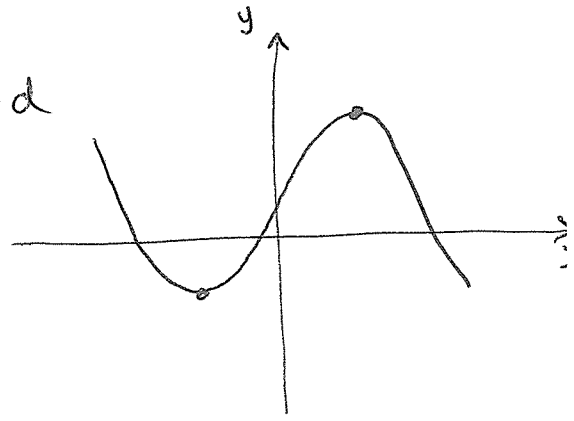
axis of symmetry $x = -\frac{b}{2a}$



③ CUBIC

$$y = ax^3 + bx^2 + cx + d$$

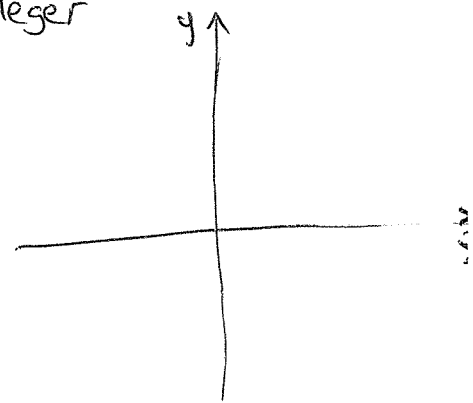
use long division to factorise



④ $f(x) = \frac{1}{x^n}$ n positive odd integer

e.g. $y = \frac{1}{x}$

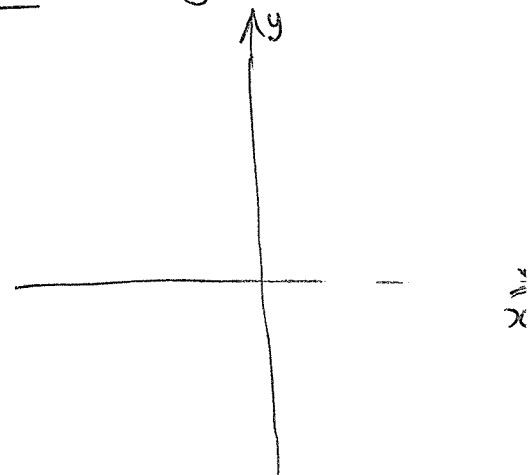
(rectangular hyperbola)



⑤ $f(x) = \frac{1}{x^n}$ n positive even integer

e.g. $f(x) = \frac{1}{x^2}$

(truncus)



TRANSFORMATIONS

① $y = c f(x)$ is a

e.g. $y = \frac{2}{x}$ if $c > 1$

if $c < 1$

② $y = f(cx)$ is a

e.g. $y = \frac{1}{(2x)^2}$ if $c > 1$

$= \frac{1}{4x^2}$ if $c < 1$

③ $y = -f(x)$ is a

④ $y = f(-x)$ is a

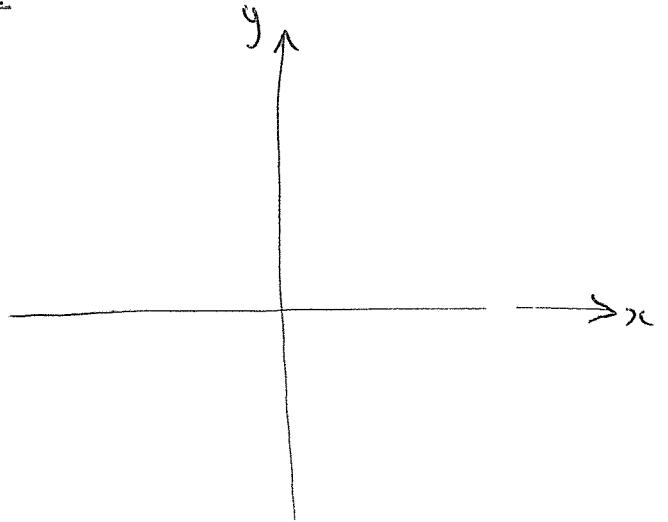
⑤ $y = f(x) + c$ is a

⑥ a) $y = f(x+c)$ is a translation

b) $y = f(x-c)$ is a translation

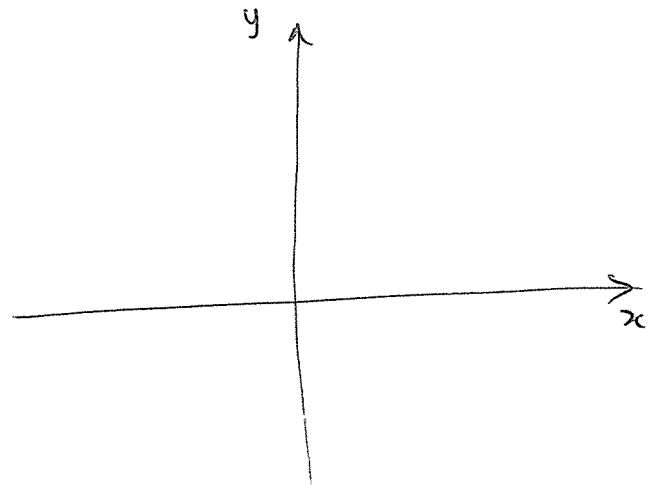
TRANSFORMATION EXAMPLES

① $y = \frac{1}{x}$



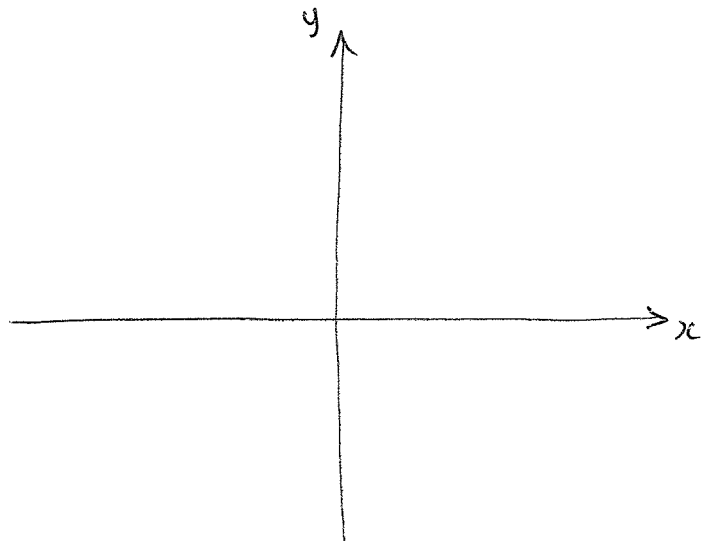
② $y = \frac{2}{x}$

is a



③ $y = \frac{2}{x-1}$

is a

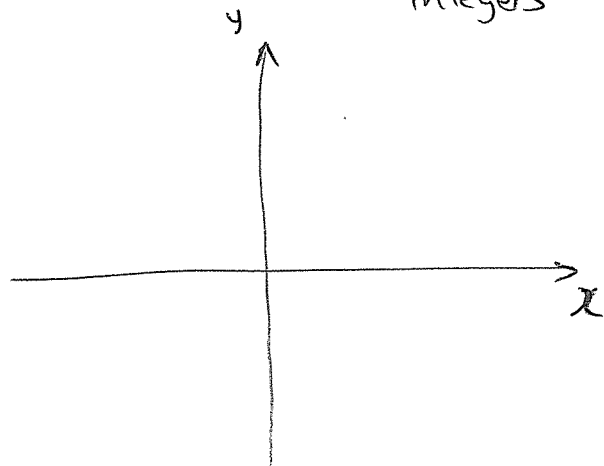


⑥

$$f(x) = x^{\frac{p}{q}}$$

p and q both positive odd integers

e.g. $f(x) = x^{\frac{1}{3}}$
 $f(x) = x^{\frac{3}{7}}$
 etc

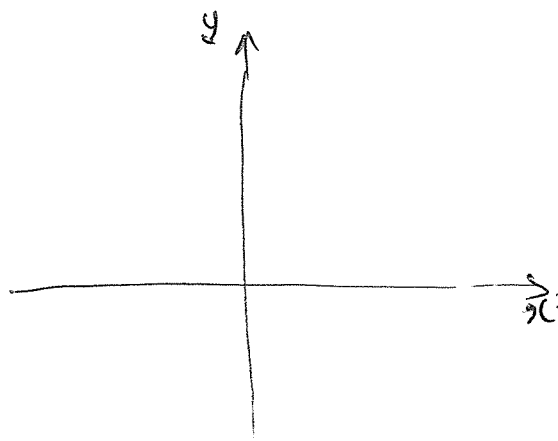


⑦

Exponential & Logarithmic

a) $y = a^x, a > 1$

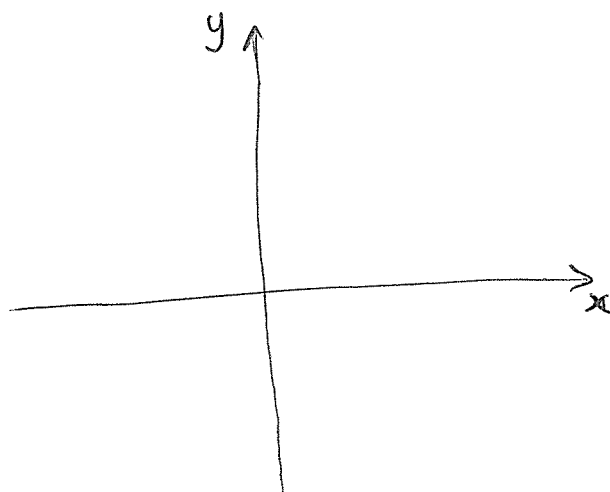
e.g. $y = 2^x$



b) $y = a^x, 0 < a < 1$

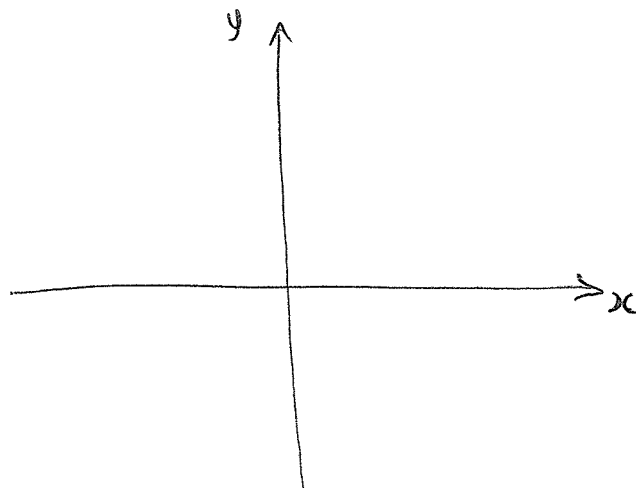
e.g. $y = \left(\frac{1}{2}\right)^x$

or $y = 2^{-x}$



c) $y = \log_a x, a > 1$

e.g. $y = \log_{10} x$



④

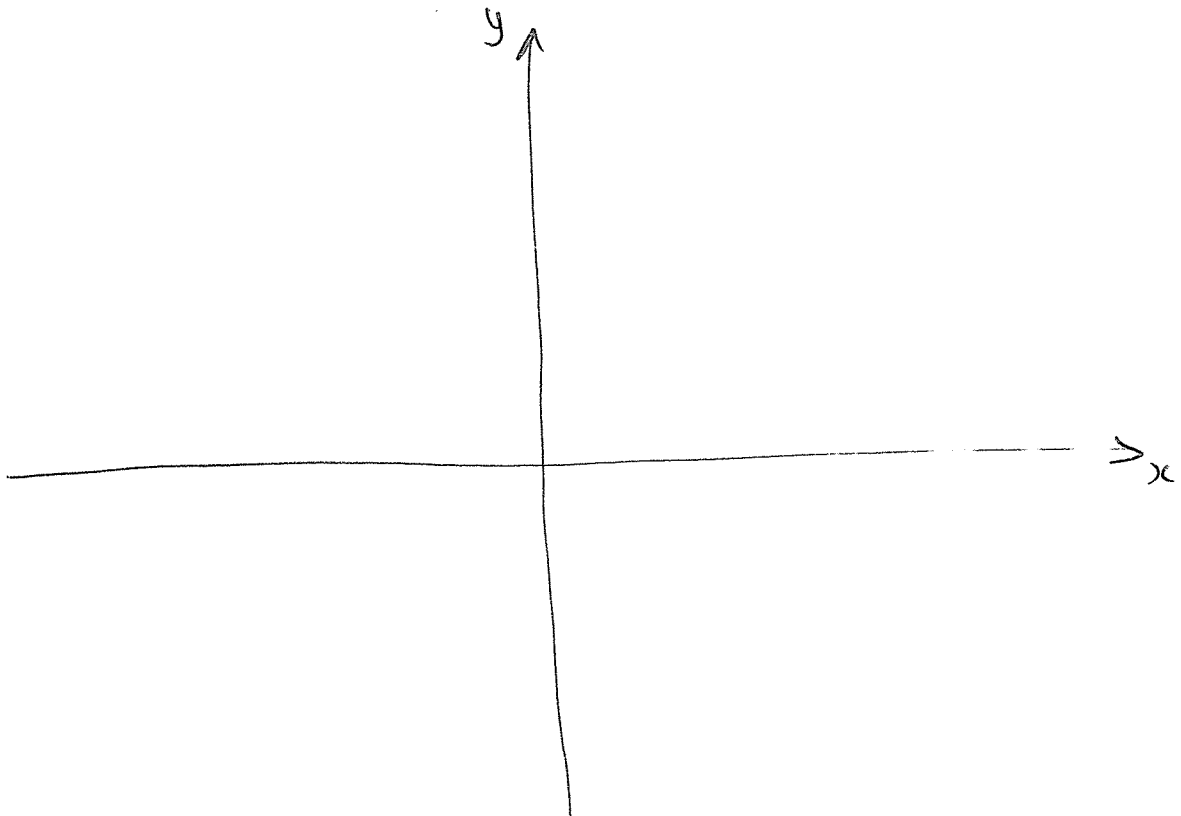
$$y = \frac{2}{x-1} + 3$$

is a:

•

•

•



finding x intercept

$$\text{let } y =$$

$$0 = \frac{2}{x-1} + 3$$

$$-3 =$$

$$-3(x-1) =$$

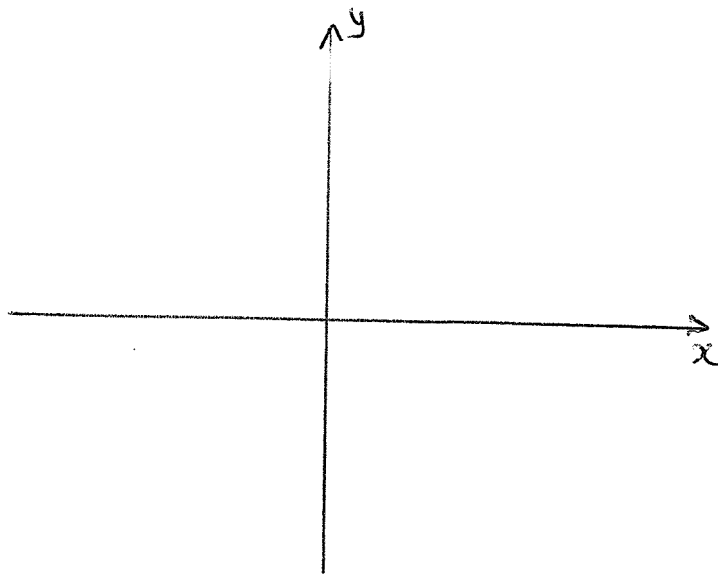
$$-3x + 3 =$$

$$-3x =$$

$$x =$$

TRANSFORMATIONS - QUESTIONS

① Sketch $y = \frac{3}{x-2} + 1$



② Sketch $y = -\frac{2}{x+1}$

