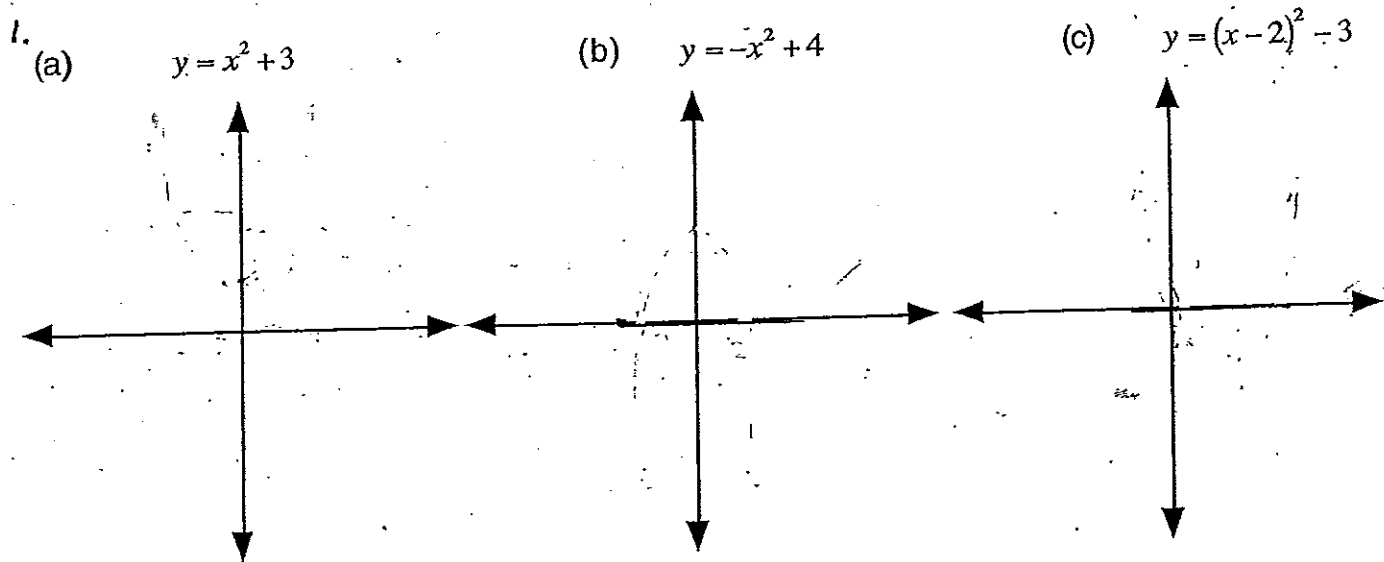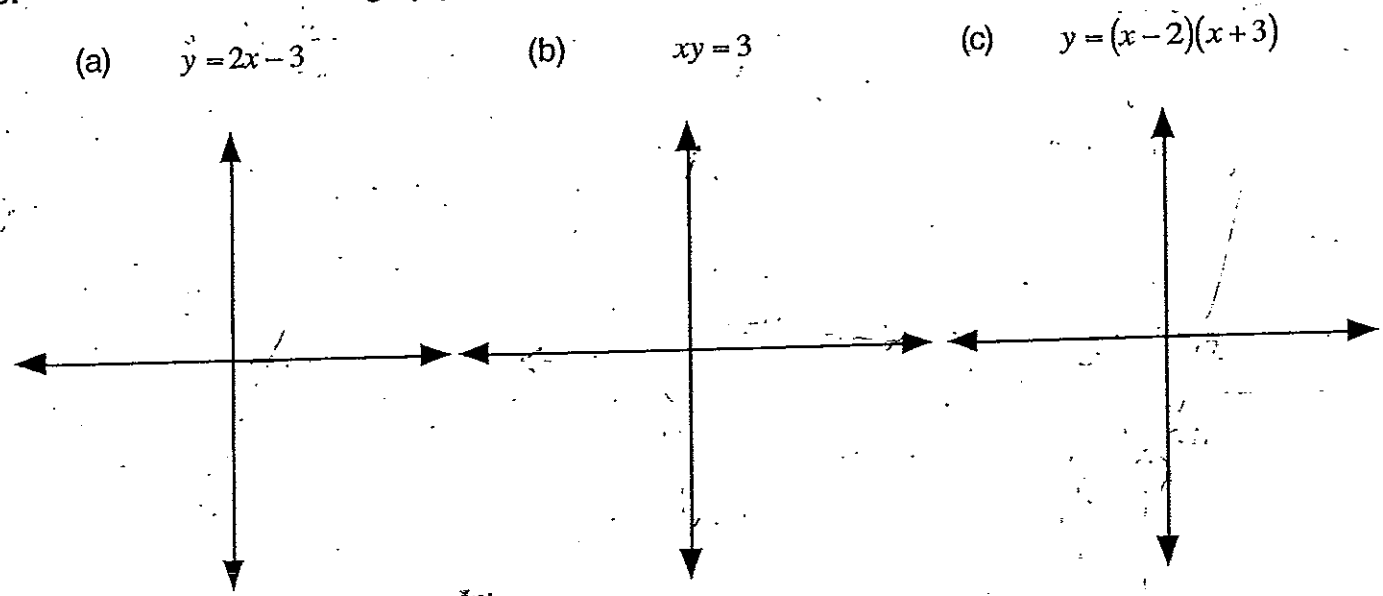## SBHS - GRAPHS AND COORDINATE GEOMETRY - 2007

NAME _____

Sketch the following equations on the number planes below. Mark any intercepts. If there are no intercepts, mark two points on the graph. Your sketches need not be to scale.
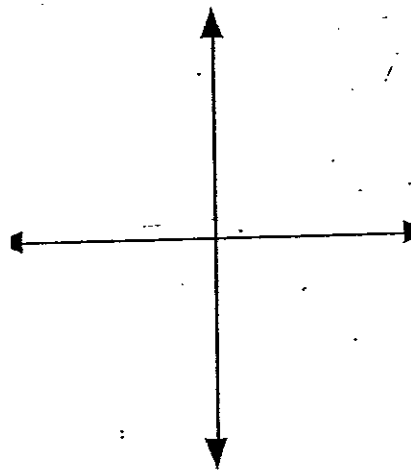
1.
(a) $y = x^2 + 3$ (b) $y = -x^2 + 4$ (c) $y = (x-2)^2 - 3$

2.   (a) At what point do exponential graphs always cross the y axis? _
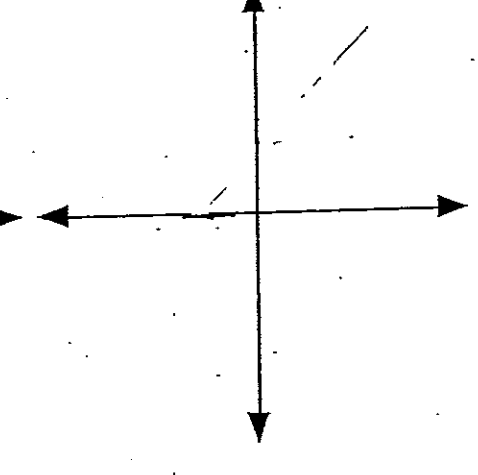
(b) Why? _

3.   Sketch the graphs of these equations.

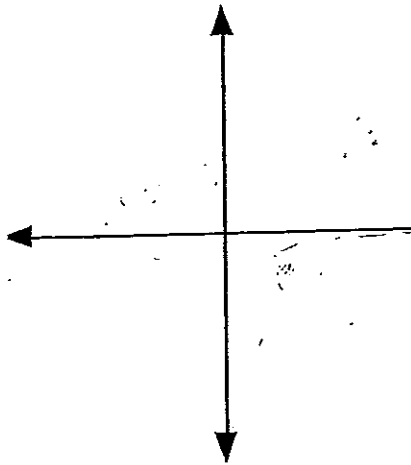(a) $y = 2x - 3$ (b) $xy = 3$ (c) $y = (x-2)(x+3)$
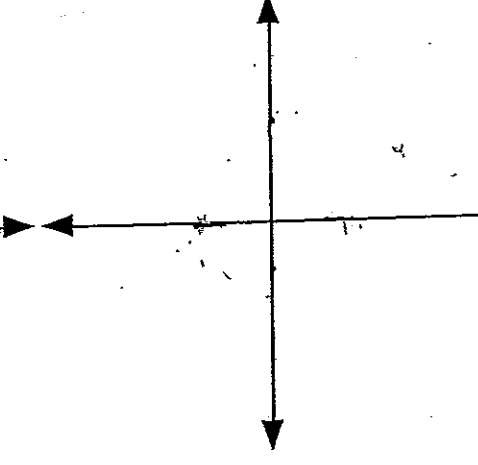

- 1 -

(d)　　$y = 3^x$

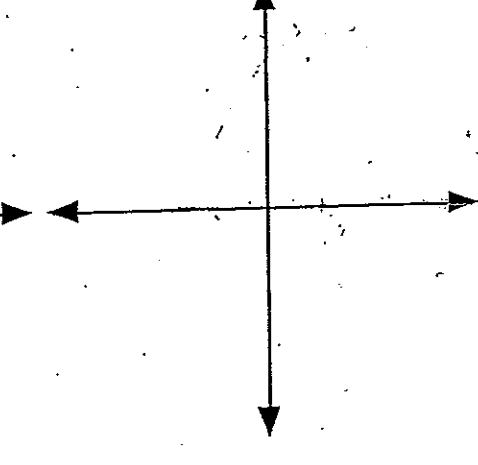(e)　　$y = \dfrac{2}{3}x$
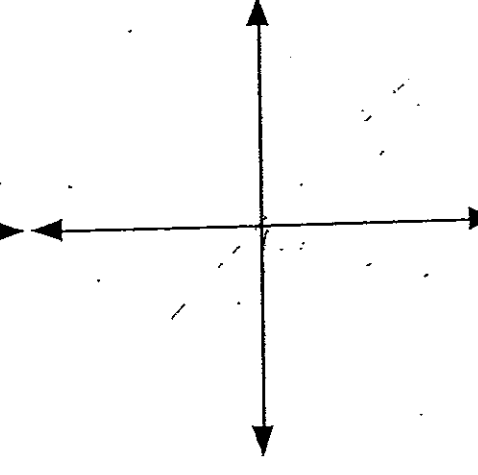
(f)　　$y = 3x + 2$
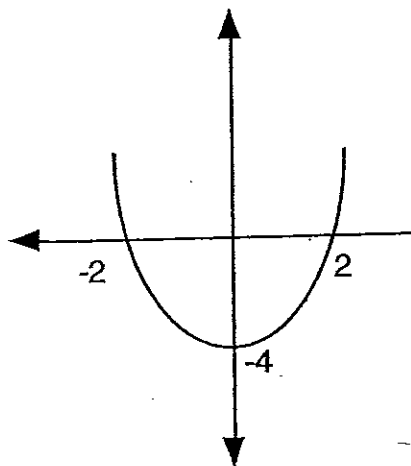
(g)　　$y = -\dfrac{4}{x}$

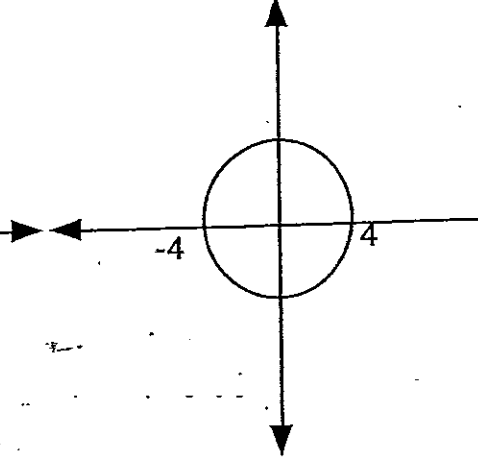(h)　　$x^2 + y^2 = 9$

(i)　　$y = (3 - x)(x + 4)$

4.　Write the correct equation under each sketch.

(a)
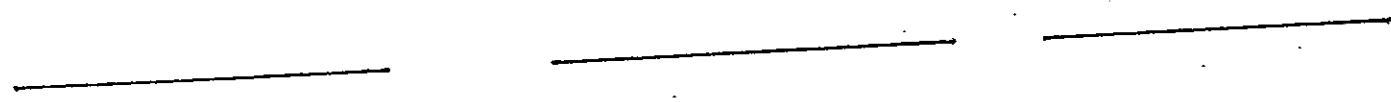
-2　　2

-4

(b)

-4　　4

(c)

(-1,2)

-2-

(continued)

(d)

On the set of axes below draw the triangle P(0,8) Q(8,7) R(4,0)

(a) Show that the triangle PQR is isosceles

(b) Name the equal sides

(c) Write down the coordinates of T, the Midpoint of PR
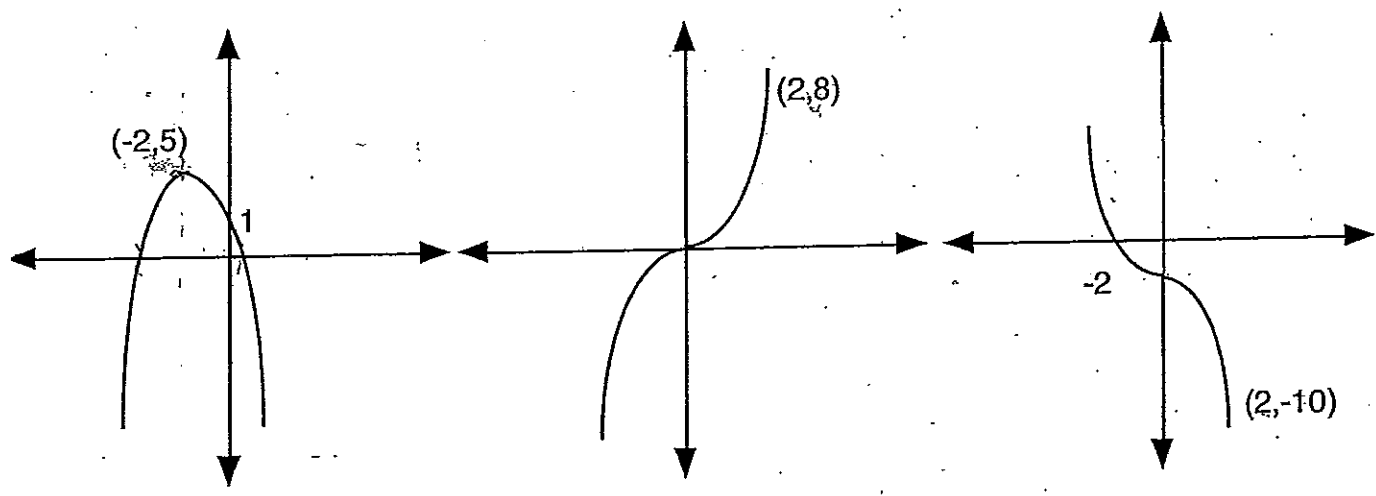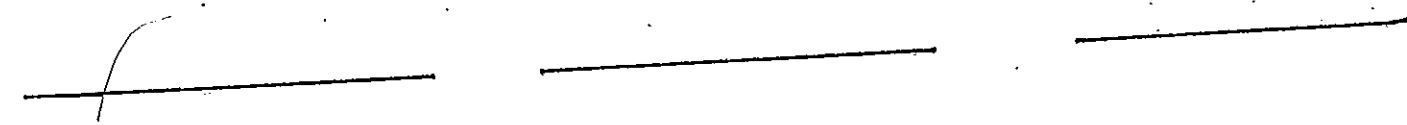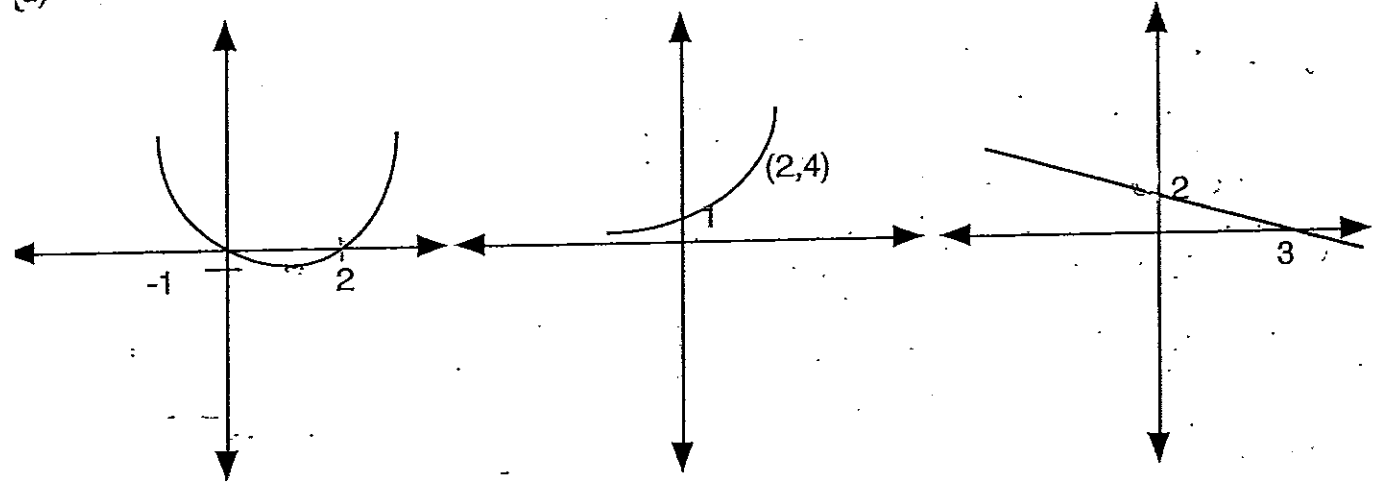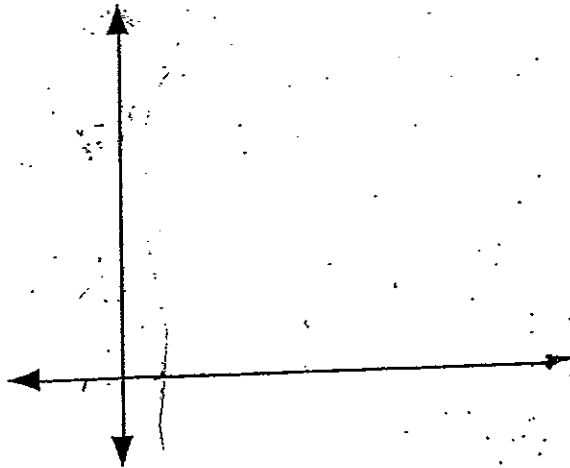
(d) Show that QT is perpendicular to PR

(e) Write the equation of QT

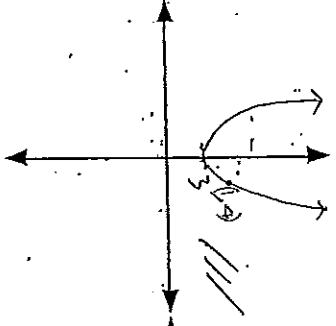(f) Find the coordinates of a point S, so that PQRS is a Rhombus.

NAME : _SOLUTIONS :_

Sketch the following equations on the number planes below: Mark any intercepts. If there are no intercepts, mark two points on the graph. Your sketches need not be to scale.
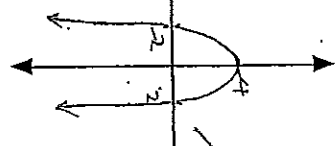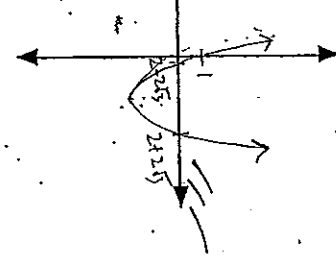
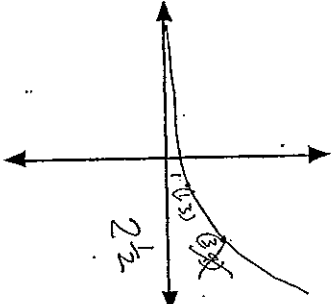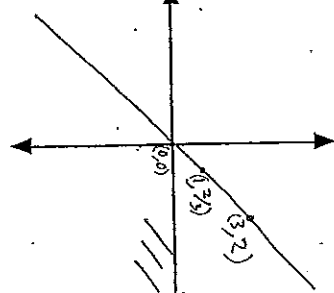**(a)** $y = x^2 + 3$

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

$$\frac{-(x^2-x-2)}{-(x^2-x-2)}$$

(c) $y = (x-2)^2 - 3$

$$\frac{x^2 + x + 4}{x^2 - x_1}$$

$$\frac{4 \pm \sqrt{16+4}}{2}$$

$$2 \pm 2\sqrt{3}$$

(d) $y = 3^x$

(e) $y = \frac{2}{3}x$

(f) $y = 3x + 2$

(g) $y = -\frac{4}{x}$

(h) $x^2 + y^2 = 9$

(i) $y = (3-x)(x+4)$

$3x + 12 - x^2 - 4x$

$-(x^2 + x - 12)$

$-(x+4)(x-3)$
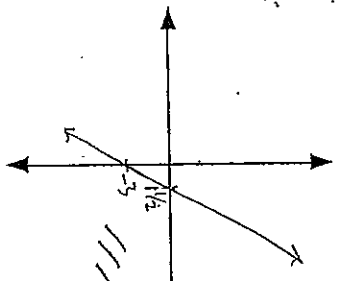
$-x^2 - x + 12$

2.
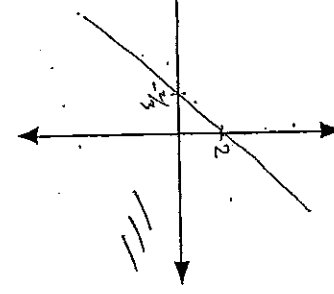
(a) At what point do exponential graphs always cross the y axis? _1_

(b) Why? _because any value to the power of 0 will always equal one._

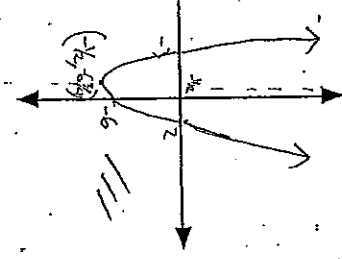3. Sketch the graphs of these equations.
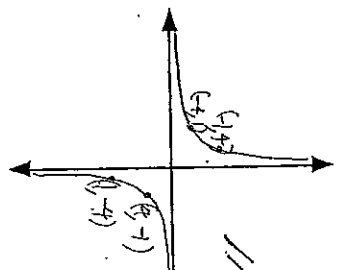
(a) $y = 2x - 3$

(b) $xy = 3$; $y = \frac{3}{x}$
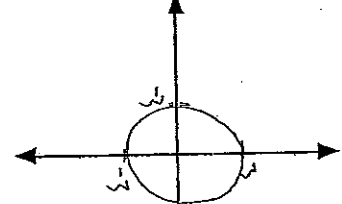
(c) $y = (x-2)(x+3)$

4.

(a) Write the correct equation under each sketch.

(b) $x^2 + y^2 = 16$

(c) $y = -\frac{2}{x}$

$(x+2)(x-2)$

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$2\frac{1}{2}$

.(continued)

On the set of axes below draw the triangle P(0,8) Q(8,7) R(4,0)

a) Show that the triangle PQR is isosceles

$PQ = \sqrt{8^2 + 1^2} = \sqrt{65}$

$PR = \sqrt{8^2 + 4^2} = \sqrt{80}$

$QR = \sqrt{4^2 + 7^2} = \sqrt{65}$

$PQ = QR$

$\triangle PQR$ is an (equal sides) isosceles

b) Name the equal sides

$PQ \; \& \; QR$

c) Write down the coordinates of T, the Midpoint of PR

$(2, 4)$

d) Show that QT is perpendicular to PR

$TQ: m_1 = \frac{7-4}{8-2} = \frac{3}{6} = \frac{1}{2}$

$PR: m_2 = \frac{8-0}{0-4} = \frac{8}{-4} = -2 \quad m_1 \times m_2 = -1$

e) Write the equation of QT

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

$y - 4 = \frac{1}{2}x - 1 \qquad y = \frac{1}{2}x + 3.$

f) Find the coordinates of a point S, so that PQRS is a Rhombus.

$-4, 1$

(d)

$x \, \text{int} = 2, 0$

$y = 0$

sym $x = 1$

Vertex $= -1$.

$y = x(x-2)$

$y = 2^x$

$(x-2)(x-0)$

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

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

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

$y = x^3$

$y = -x^3 - 2$

$x = 2 ?? \; \& \; $

sym $= -2$

$y = 1$

Vertex 5

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

$= -x^2 + 2x + 3x$

$x = \frac{-2 \pm \sqrt{4 + 16}}{2} = \frac{-2 \pm \sqrt{20}}{2}$

$= \frac{-2 \pm \sqrt{20}}{2}$

⑩