Show work for each question to receive full marks.

1. Solve the following systems of equations by any method.

a) $y = 3x + 1$ b) $8a - 3b = 10$

    $y = 4x + 15$ $7a + 3b = 20$

2. Graph each parabola and state:
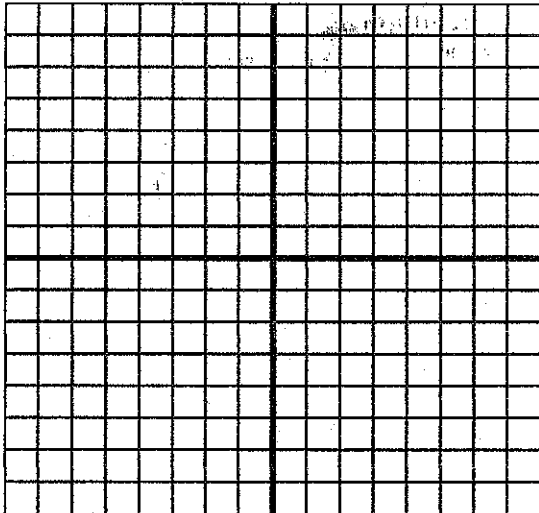
a) vertex

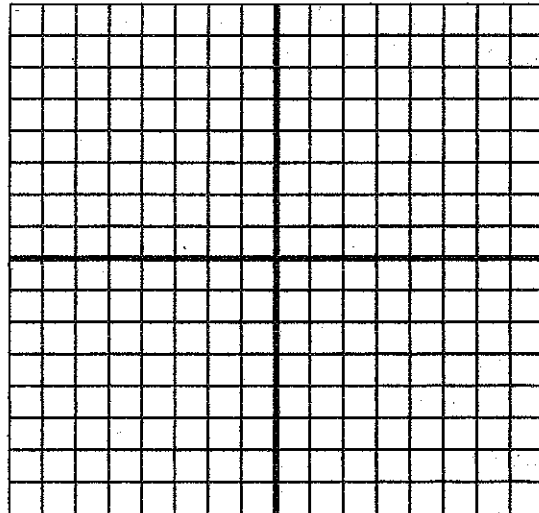b) y-intercept

c) x-intercept(s)

d) domain and range

i) $y = -(x - 2)^2 - 1$ ii) $y = 0.5x^2 - 4x + 1$

3. Solve each quadratic by the method of your choice.

a) $m^2 - 7 = 29$

b) $2(w - 3)^2 = 50$

c) $d^2 + d - 12 = 0$

d) $3x^2 + 17x + 10 = 0$

4. Write a quadratic equation with roots 3 and -1/2.

5. Factor $4x^3 - 11x^2 - 6x + 9$

6. Solve $g^3 - 5g^2 + 7g - 2 = 0$

Show your method for solving each word problem.
7. Portobello mushrooms sell for $6.60/kg and shiitake mushrooms sell for $11.00/kg.
Find the mass of each mushroom needed to make a 1 kg bag worth $8.36.
(Hint: Let mass of Portobello mushrooms be P and mass of Shiitake mushrooms be S)

8. A museum has an admission fee of $14 and averages 300 visitors per day. Research
indicates that for every $1 increase, there would be 10 fewer visitors per day. What
admission fee would maximize the revenue?

9. An arched shaped bridge over a river can be modeled by the equation
$h = -0.05d^2 + 18.2$, where h is the height of the bridge in meters and d is the distance from
the centre of the bridge.
a) What is the maximum height of the arch?

b) How wide is the arch?

c) How high is the arch 10 m from the middle?

$h = -0.05d^2 + 18.2$