

XT - MATHS Grade 11

Name: _____

Class: _____

Subject: Functions 1: Parabolas and Lines

Date: _____

Total Marks: 66

Question 1: True/False [6]

Mathematics - LO 2 : AS 3

The parabola $y = 3x^2 + x$ and the line $y = 3x + 1$ intersect at the points $x = -\frac{1}{3}$ and $x = 1$.

TRUE

FALSE

Question 2: True/False [4]

Mathematics - LO 2 : AS 2, AS 3

The graph of the function $g(x) = -2x^2 + 4x - 3$ has a maximum value of -1 when $x = 1$.

TRUE

FALSE

Question 3: True/False [2]

Mathematics - LO 2 : AS 3

The y -intercept of the graph of the function $y = 3x^2 - 4x - 4$ is $(-4; 0)$.

TRUE

FALSE

Question 4: Multiple Choice [4]

Mathematics - LO 2 : AS 2, AS 3

The point $(2; 6)$ lies on a parabola with turning point $(1; 4)$.
The equation of the parabola is ...

A $y = \frac{9}{2} (x^2 + 2x + 1) + 4$

B $y = 2x^2 - 4x + 6$

C $y = 10x^2 - 20x + 14$

D $y = -2x^2 + 8x - 2$

E $y = -\frac{2}{25} (x^2 - 2x + 1) + 4$

Question 5: Multiple Choice [4]

Mathematics - LO 2 : AS 3

The point $(1; -12)$ lies on a parabola with x -intercepts 3 and -2 .
The equation of the parabola is ...

A $y = 2x^2 - 2x - 12$

B $y = x^2 - x - 6$

C $y = x^2 - 5x - 6$

D $y = x^2 - x - 12$

Question 6: Multiple Choice [3]

Mathematics - LO 2 : AS 3

The graph of the function $y = ax^2 + bx + c$ with $b^2 < 4ac$, will ...

A cut the x -axis in one place.

B cut the x -axis in two places.

C not cut the x -axis.

Question 7 refers to the following graphic

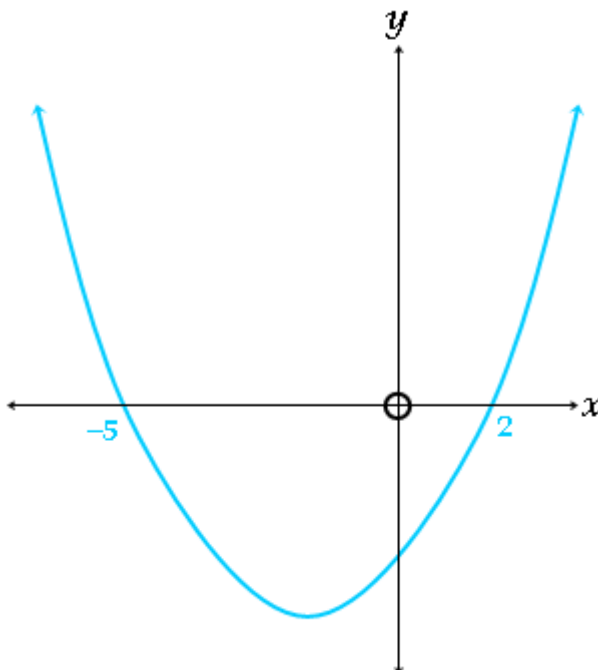


Figure 1: 712

Question 7: Multiple Choice [4]

Mathematics - LO 2 : AS 3

Determine the equation of the given graph which cuts the y -axis at -10 .

A $y = x^2 + 3x - 10$

B $y = x^2 - 3x - 10$

C $y = -x^2 + 3x - 10$

D $y = -x^2 - 3x - 10$

Question 8: Socrates [6]

Mathematics - LO 2 : AS 3

Determine if the line $y = x - 3$ is a tangent or a secant to the parabola $y = x^2 - 5x + 2$.
Type in just the word: "tangent" or "secant"**Question 9: Socrates [6]**

Mathematics - LO 2 : AS 3

Determine if the line $y = x - 3$ is a tangent or a secant to the parabola $y = x^2 + 3x - 2$.
Type in just the word: "tangent" or "secant"**Question 10: Socrates [2]**

Mathematics - LO 2 : AS 2

The function $f(x) = -3(x + 1)^2 - 2$ is vertically translated so that its turning point now rests on the x -axis.
The coordinates of the new y -intercept are ...

Give your answer in the form (a; b).

Question 11: Socrates [1]

Mathematics - LO 2 : AS 2

The function $f(x) = -3x^2 + 2x - 5$ has a ... value.

Type either "minimum" or "maximum" as your answer.

Question 12: Cloze [6]

Given function: $y = 2 \left(x - \frac{1}{2} \right)^2 + 4\frac{1}{2}$

The turning point of this function is (Ans. 1).
 The function can also be written in the form (Ans. 2).
 The x -intercepts of the function are (Ans. 3).

1	
3	

2	
----------	--

▶ $y = 2x^2 - 2x + 5$

▶ $\left(\frac{1}{2}; 4\frac{1}{2} \right)$

▶ irrational

▶ $\left(\frac{1}{2}; 1\frac{1}{4} \right)$

▶ $y = 2x^2 - 2x + 4$

▶ $y = x^2 - x + 2$

▶ non-real

▶ rational

▶ $\left(-\frac{1}{2}; 4\frac{1}{2} \right)$

Question 13: Cloze [6]

Given the function $f(x) = 3(x - 2)^2 + 3$.
 The coordinates of the turning point of the function are (Ans. 1)
 If the graph of this function is moved **three** units vertically up,
 then the turning point of the graph of that function will be (Ans. 2).
 The equation of the new function will then be (Ans. 3).

1	
3	

2	
----------	--

▶ (2 ; 6)

▶ $f(x) = 3x^2 - 12x + 18$

▶ (5 ; 3)

▶ $f(x) = 3x^2 - 30x + 78$

▶ (5 ; 6)

▶ $f(x) = 3x^2 - 30x + 81$

▶ (2 ; 3)

▶ (-2 ; 3)

Question 14 refers to the following graphic

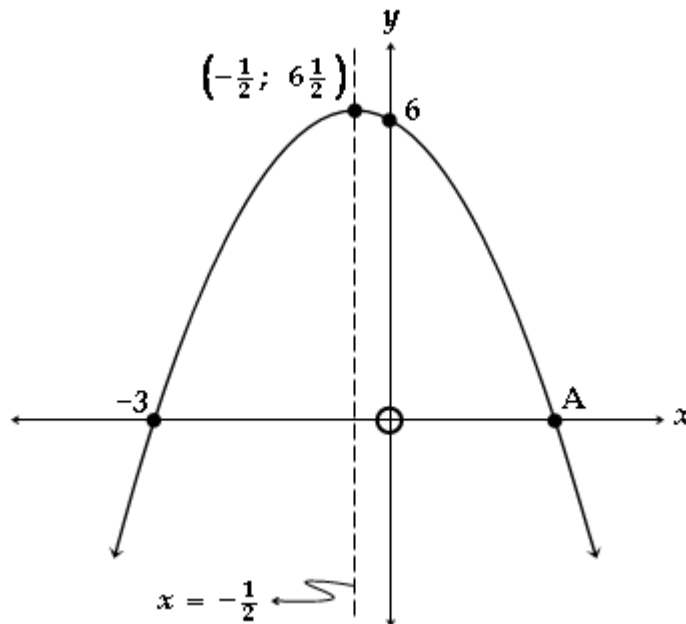


Figure 2: 722

Question 14: Cloze [8]

Mathematics - LO 2 : AS 2, AS 3; LO 3 : AS 4

Use the accompanying graph to determine the following:

The coordinates of A are (Ans. 1).

The equation of this function is (Ans. 2).

The equation of the graph symmetrical to the given graph about the x -axis is (Ans. 3).

1	
---	--

2	
---	--

3	
---	--

▶ $(2; 0)$

▶ $(1\frac{1}{2}; 0)$

▶ $(1; 0)$

▶ $y = -x^2 - x + 6$

▶ $y = -5x^2 - 13x + 6$

▶ $y = x^2 + 5x + 6$

▶ $y = x^2 + x - 6$

▶ $y = -x^2 + x + 6$

▶ $y = x^2 + x + 6$

Question 15: Multiple Choice [4]

Mathematics - LO 2 : AS 2, AS 3

The point $(-2; 8)$ lies on a parabola that touches the x -axis at -4 .

The equation of the parabola is ...

A $y = 2x^2 + 8$

B $y = x^2 + 8x + 16$

C $y = \frac{2}{9}(x - 4)^2$

D $y = 2x^2 + 16x + 32$

E $y = x^2 + 4$