Training test

Question 1

correct

Mark 100.00 out of 100.00

The figure shows the graph of the function
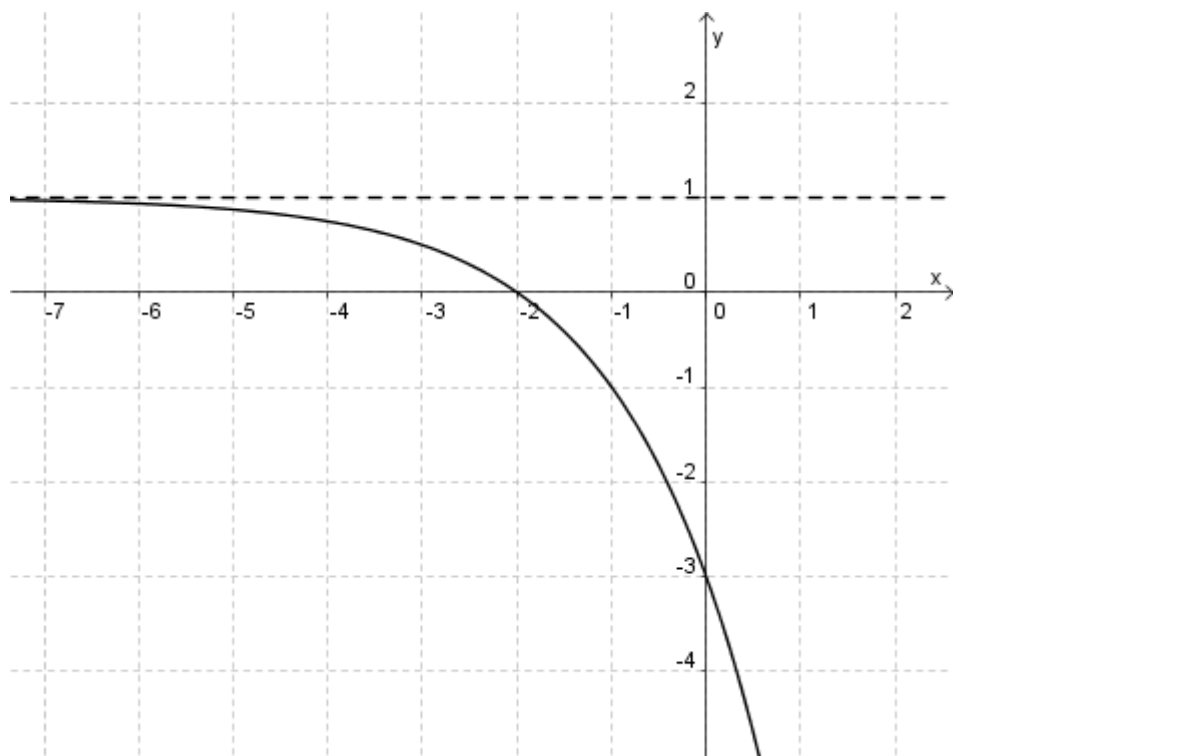
- ○ (TO) $y = 1 - 2 \cdot 4^x$
- ○ (B) $y = 1 - 2^x$
- ⊙ (C) $y = 1 - 4 \cdot 2^x$ ✓
- ○ (D) $y = 1 - 4^x$
- ○ (IS) $y = 1 - 2 \cdot 2^x$

The correct answer is: $y = 1 - 4 \cdot 2^x$

Question 2

correct

Mark 100.00 out of 100.00

Simplifying the expression $\left(-\dfrac{3}{10}a^2b^2c^2\right) \times \left(\dfrac{4}{3}a^2b^2 + \dfrac{1}{6}a^2b^2 - \dfrac{1}{4}a^2b^2\right)$, where a and b are two real numbers, we obtain

- ⊙ (TO) $-\dfrac{3}{8}a^4b^4c^2$ ✓
- ○ (B) $-\dfrac{6}{25}a^2b^2c^2$
- ○ (C) $-\dfrac{3}{8}a^2b^2c^2$
- ○ (D) $-\dfrac{6}{25}a^4b^2c^2$
- ○ (IS) $-\dfrac{3}{8}c^2$

The correct answer is: $-\dfrac{3}{8}a^4b^4c^2$

Question 3

correct

Mark 100.00 out of 100.00

To cover the 120 km that separate Turin from Milan, a truck takes 2 hours and 40 minutes. A car, which leaves Turin for Milan three quarters of an hour after the truck, travels at an average speed twice that of the truck. Then

- ○ (A) the car arrives in Milan 15 minutes before the truck
- ⊙ (B) the car arrives in Milan 35 minutes before the truck ✓
- ○ (C) the car and the truck arrive together in Milan
- ○ (D) the car arrives in Milan 15 minutes after the truck
- ○ (E) the car arrives in Milan 35 minutes after the truck

The correct answer is: the car arrives in Milan 35 minutes before the truck

Question 4

correct

Mark 100.00 out of 100.00

Let be x a positive real number. The real number

$$\frac{\sqrt{\sqrt[3]{(x+1)^5}}}{\sqrt[4]{(x+1)^3}}$$

It's equal to

- ⊙ (TO) $\sqrt[12]{(x+1)}$ ✔
- ○ (B) $(x+1)^{12}$
- ○ (C) $\sqrt[9]{(x+1)^{10}}$
- ○ (D) $\sqrt[4]{(x+1)}$
- ○ (IS) $x+1$

The correct answer is: $\sqrt[12]{(x+1)}$

Question 5

incorrect

Mark -25.00 out of 100.00

Consider two spheres in space both of radius 2 and of centers P_1 and P_2 respectively. If the distance between P_1 and P_2 is 3, then the intersection of the spheres is:

- ○ (A) a point
- ○ (B) the empty set
- ○ (C) a circumference
- ○ (D) a parable
- ⊙ (E) an ellipse with different axle shafts ✗

The correct answer is: a circumference

Question 6

incorrect

Mark -25.00 out of 100.00

The equation $\left(x^5 - 4x^3\right)^2 = 0$ has:

- ○ (A) no real solution
- ○ (B) only the solution $x = 0$
- ○ (C) only the solutions $x = 0$ e $x = 2$
- ○ (D) three distinct real solutions
- ⊙ (E) ten distinct real solutions ✗

The correct answer is: three distinct real solutions

Question 7

correct

Mark 100.00 out of 100.00

A car factory provides the customer with the opportunity to choose six different body colors, two different interior fittings and three different types of alloy wheels for a car. How many different ways can the car be set up?

- ○ (TO) 12^3
- ○ (B) 6^6
- ○ (C) 11
- ○ (D) 6^{2^3}
- ⦿ (E) 36 ✓

The correct answer is: 36

Question 8

correct

Mark 100.00 out of 100.00

The expression $2 \sin \dfrac{5\pi}{12} \cos \dfrac{5\pi}{12}$ is equal to:

- ⦿ (TO) $1/2$ ✓
- ○ (B) $\sqrt{3}/2$
- ○ (C) 2
- ○ (D) $-1/2$
- ○ (IS) $\sin \dfrac{5\pi}{24}$

The correct answer is: $1/2$

Question 9

correct

Mark 100.00 out of 100.00

A common divisor of monomials $8a^3x^6,\ 4a^2x^6y,\ a^4bx^3y^2$ and '

- ○ (TO) a^2bx^6y
- ○ (B) x^6y^2
- ⦿ (C) a^2x^3 ✓
- ○ (D) axy
- ○ (IS) $a^3x^6y^2$

The correct answer is: a^2x^3

Question 10

correct

Mark 100.00 out of 100.00

Which of these equations represents a straight line parallel to the straight line passing through the points $(0, -1)$ and $(2, 3)$?

- ○ (TO) $x - 3y - 2 = 0$
- ◉ (B) $2x - y - 2 = 0$ ✓
- ○ (C) $2x + y - 1 = 0$
- ○ (D) $x - 2y + 3 = 0$
- ○ (IS) $2x + y = 0$

The correct answer is: $2x - y - 2 = 0$

Question 11

correct

Mark 100.00 out of 100.00

The expression $\dfrac{2^{x-y}}{6^{x+y}}$ is equal to:

- ○ (TO) $\dfrac{1}{3^{2x}}$
- ○ (B) 12^{-y}
- ◉ (C) $3^{-x-y}4^{-y}$ ✓
- ○ (D) $\dfrac{1}{3^{x}}$
- ○ (IS) 12^{-x}

The correct answer is: $3^{-x-y}4^{-y}$

Question 12

correct

Mark 100.00 out of 100.00

The sum of the ages of two brothers is now 20 years old. In four years the age of the elder will be equal to three times its current age minus double the current age of the minor. How old are the two brothers?

- ○ (A) 13 and 7 years old
- ○ (B) 12 and 8 years old
- ◉ (C) 11 and 9 years old ✓
- ○ (D) are twins
- ○ (E) 15 and 5 years old

The correct answer is: 11 and 9 years

Question 13

correct

Mark 100.00 out of 100.00

The prime factorization of the number $(2^6 - 2^2)^2 3^2$ is:

○ (TO) $2^4 3^6 5^2$

○ (B) $2^4 3^3 5^2$

◉ (C) $2^4 3^4 5^2$ ✓

○ (D) $2^2 3^4 5^2$

○ (IS) $2^3 3^3 5$

The correct answer is: $2^4 3^4 5^2$

Question 14

correct

Mark 100.00 out of 100.00

In $\left[\dfrac{\pi}{2}, \dfrac{3}{2}\pi\right]$ the interval the equation $\cos^2 x = \dfrac{1}{5}$

○ (A) has only one solution

○ (B) has four distinct solutions

○ (C) has infinite solutions

○ (D) has no solutions

◉ (E) has two distinct solutions ✓

The correct answer is: it has two distinct solutions

Question 15

correct

Mark 100.00 out of 100.00

Equation circles are given

$$x^2 + y^2 - 2x - 4y - 4 = 0, \qquad x^2 + y^2 - 4y + 3 = 0.$$

We can say that the two circumferences

○ (A) are separated and the first is internal to the second

○ (B) are tangent

◉ (C) are separated and the second is internal to the first ✓

○ (D) intersect at two distinct points

○ (E) intersect at four distinct points

The correct answer is: they are separate and the second is internal to the first

Consider the inequalities

$$A) \ P(x) > 0, \qquad B) \ \frac{P(x)}{x^2 + 1} > 0, \qquad C) \ \frac{P(x)}{x^2 - 1} > 0,$$

where $P(x)$ is a second degree polynomial. Which of the following statements is correct?

○ (A) inequalities A) and C) have the same set of solutions

◉ (B) you can't answer because you don't know the polynomial $P(x)$ ✗

○ (C) the three inequalities have the same set of solutions

○ (D) inequalities B) and C) have the same set of solutions

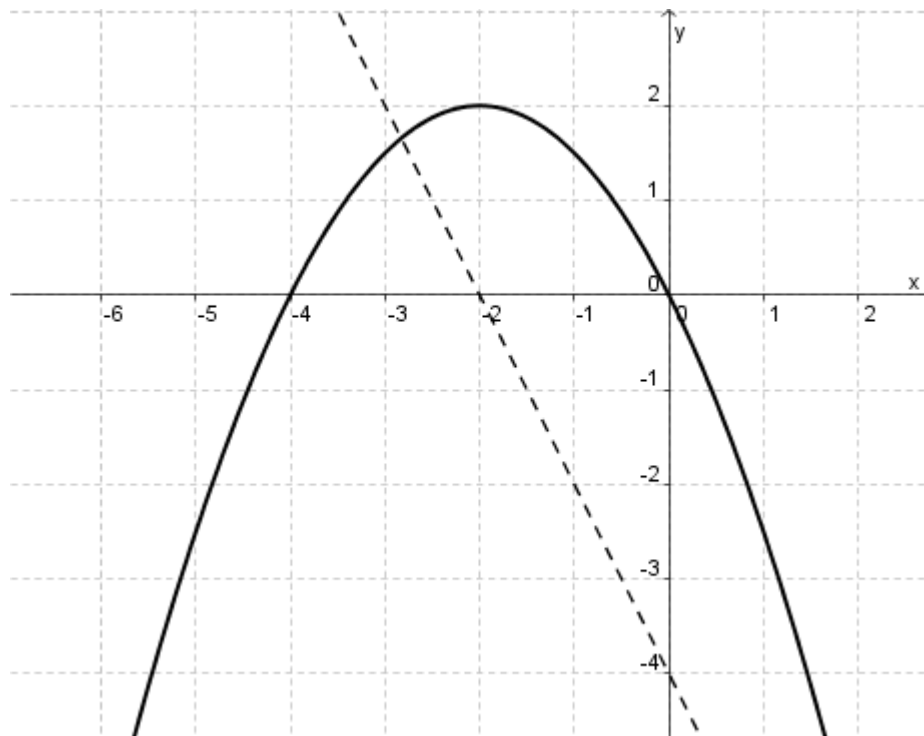○ (E) inequalities A) and B) have the same set of solutions

The correct answer is: inequalities A) and B) have the same set of solutions

Question 17

correct

Mark 100.00 out of 100.00

The figure shows a straight line and a parabola, which are the graph of the functions

- ○ (A) $f(x) = -2x - 4, g(x) = -x^2 - 4x$

- ○ (B) $f(x) = -2x - 4, g(x) = -\frac{1}{2}x^2 + 2x - 1$

- ○ (C) $f(x) = -2x - 2, g(x) = -\frac{1}{2}x(x + 4)$

- ◉ (D) $f(x) = -2x - 4, g(x) = -\frac{1}{2}x(x + 4)$ ✓

- ○ (E) $f(x) = -x - 2, g(x) = -x^2 - 4x$

The correct answer is: $f(x) = -2x - 4, g(x) = -\frac{1}{2}x(x + 4)$

Question 18

correct

Mark 100.00 out of 100.00

Only one of the following statements is correct; identify which one.

- ○ (A) Two rhombuses with the same perimeter are necessarily similar

- ○ (B) Two trapezes with the same area are necessarily similar

- ○ (C) Two rectangles with the same area are necessarily similar

- ○ (D) Two isosceles triangles with the same base are necessarily similar

- ◉ (E) Two right triangles with the two neatly congruent acute angles are necessarily similar
  ✓

The correct answer is: Two right triangles with the two neatly congruent acute angles are necessarily similar