Select the correct description of right-hand and left-hand behavior of the graph of the polynomial function.

ƒ(x) = 4x2 - 5x + 4

|  |  |  |
| --- | --- | --- |
|  |  | Falls to the left, rises to the right. |
|  |  | Falls to the left, falls to the right. |
|  |  | Rises to the left, rises to the right. |
|  |  | Rises to the left, falls to the right. |
|  |  | Falls to the left. |

QUESTION 2

Describe the right-hand and the left-hand behavior of the graph of

t(x) = 4x5 - 7x3 - 13

|  |  |  |
| --- | --- | --- |
|  |  | Because the degree is odd and the leading coefficient is positive, the graph falls to the left and rises to the right. |
|  |  | Because the degree is odd and the leading coefficient is positive, the graph rises to the left and rises to the right. |
|  |  | Because the degree is odd and the leading coefficient is positive, the graph falls to the left and falls to the right. |
|  |  | Because the degree is odd and the leading coefficient is positive, the graph rises to the left and falls to the right. |
|  |  | Because the degree is even and the leading coefficient is positive, the graph rises to the left and rises to the right. |

QUESTION 3

Select the correct description of right-hand and left-hand behavior of the graph of the polynomial function.

ƒ(x) = 3 - 5x + 3x2 - 5x3

|  |  |  |
| --- | --- | --- |
|  |  | Falls to the left, rises to the right. |
|  |  | Falls to the left, falls to the right. |
|  |  | Rises to the left, rises to the right. |
|  |  | Rises to the left, falls to the right. |
|  |  | Falls to the left. |

QUESTION 4

Select from the following which is the polynomial function that has the given zeroes.

2,-6

|  |  |  |
| --- | --- | --- |
|  |  | f(x) = x2 - 4x + 12 |
|  |  | f(x) = x2 + 4x + 12 |
|  |  | f(x) = -x2 -4x - 12 |
|  |  | f(x) = -x2 + 4x - 12 |
|  |  | f(x) = x2 + 4x - 12 |

QUESTION 5

Select from the following which is the polynomial function that has the given zeroes.

0,-2,-4

|  |  |  |
| --- | --- | --- |
|  |  | f(x) = -x3 + 6x2 + 8x |
|  |  | f(x) = x3 - 6x2 + 8x |
|  |  | f(x) = x3 + 6x2 + 8x |
|  |  | f(x) = x3 - 6x2 - 8x |
|  |  | f(x) = x3 + 6x2 - 8x |

QUESTION 6

Sketch the graph of the function by finding the zeroes of the polynomial.

f(x) = 2x3 - 10x2 + 12x

|  |  |  |
| --- | --- | --- |
|  |  | 0,2,3  https://content.grantham.edu/at/MA105/exams/w5_6_a.jpg |
|  |  | 0,2,-3  https://content.grantham.edu/at/MA105/exams/w5_6_b.jpg |
|  |  | 0,-2,3  https://content.grantham.edu/at/MA105/exams/w5_6_c.jpg |
|  |  | 0,2,3  https://content.grantham.edu/at/MA105/exams/w5_6_d.jpg |
|  |  | 0,-2,-3  https://content.grantham.edu/at/MA105/exams/w5_6_e.jpg |

QUESTION 7

Select the graph of the function and determine the zeroes of the polynomial.

f(x) = x2(x-6)

|  |  |  |
| --- | --- | --- |
|  |  | 0,6,-6  https://content.grantham.edu/at/MA105/exams/w5_7_a.jpg |
|  |  | 0,6  https://content.grantham.edu/at/MA105/exams/w5_7_b.jpg |
|  |  | 0,-6  https://content.grantham.edu/at/MA105/exams/w5_7_c.jpg |
|  |  | 0,6  https://content.grantham.edu/at/MA105/exams/w5_7_d.jpg |
|  |  | 0,-6  https://content.grantham.edu/at/MA105/exams/w5_7_e.jpg |

QUESTION 8

Use the Remainder Theorem and Synthetic Division to find the function value.

g(x) = 3x6 + 3x4 - 3x2 + 6, g(0)

|  |  |  |
| --- | --- | --- |
|  |  | 6 |
|  |  | 3 |
|  |  | -3 |
|  |  | 8 |
|  |  | 7 |

QUESTION 9

Use the Remainder Theorem and Synthetic Division to find the function value.

f(x) = 3x3 - 7x + 3, f(5)

|  |  |  |
| --- | --- | --- |
|  |  | -343 |
|  |  | 343 |
|  |  | 345 |
|  |  | 340 |
|  |  | 344 |

QUESTION 10

Use the Remainder Theorem and Synthetic Division to find the function value.

h(x) = x3 - 4x2 - 9x + 7, h(4)

|  |  |  |
| --- | --- | --- |
|  |  | -28 |
|  |  | -27 |
|  |  | -31 |
|  |  | -25 |
|  |  | -29 |

QUESTION 11

Use synthetic division to divide:

(3x3 - 24x2 + 45x - 54) ÷ (x-6)

|  |  |  |
| --- | --- | --- |
|  |  | 6x2 - 3x - 9, x ≠ 6 |
|  |  | 6x2 -3x - 9, x ≠ 6 |
|  |  | 3x2 - 6x + 9, x ≠ 6 |
|  |  | 3x2 - 6x - 9, x ≠ 6 |
|  |  | 3x2 + 6x + 9, x ≠ 6 |

QUESTION 12

Use synthetic division to divide:

(x3 - 27x + 54) ÷ (x - 3)

|  |  |  |
| --- | --- | --- |
|  |  | x2 + 3x - 18, x ≠ 3 |
|  |  | x2 - 3x - 27, x ≠ 3 |
|  |  | x2 + 9x + 18, x ≠ 3 |
|  |  | x2 + 9x - 6, x ≠ 3 |
|  |  | x2 + 6x + 9, x ≠ 3 |

QUESTION 13

Use synthetic division to divide:

(4x3 - 9x + 16x2 - 36) ÷ (x + 4)

|  |  |  |
| --- | --- | --- |
|  |  | 4x2 - 9, x ≠ -4 |
|  |  | 4x2 + 9, x ≠ -4 |
|  |  | -4x2 - 9, x ≠ -4 |
|  |  | 4x3 - 9, x ≠ -4 |
|  |  | 4x3 + 9, x ≠ -4 |

QUESTION 14

Use synthetic division to divide:

https://content.grantham.edu/at/MA105/exams/w5_14.jpg

|  |  |  |
| --- | --- | --- |
|  |  | 5x2 + 45x + 25, x ≠ 1/5 |
|  |  | 16x2 + 80x + 20, x ≠ 1/5 |
|  |  | 100x2 + 45x + 400, x ≠ 1/5 |
|  |  | 20x2 + 180x + 400, x ≠ 1/5 |
|  |  | 4x2 + 21x + 20, x ≠ 1/5 |

QUESTION 15

Find all of the zeroes of the function.

(x - 3)(x + 9)3

|  |  |  |
| --- | --- | --- |
|  |  | -3,9 |
|  |  | 3,9 |
|  |  | -3,-9 |
|  |  | -3,3,9 |
|  |  | 3,-9 |

QUESTION 16

Find all the rational zeroes of the function.

x3 - 12x2 + 41x - 42

|  |  |  |
| --- | --- | --- |
|  |  | -2, -3, -7 |
|  |  | 2, 3, 7 |
|  |  | 2, -3, 7 |
|  |  | -2, 3, 7 |
|  |  | -2, 3, -7 |

QUESTION 17

Determine all real zeroes of f.

f(x) = x3 + x2 - 25x - 25

|  |  |  |
| --- | --- | --- |
|  |  | -5,1,0 |
|  |  | 5,0,-5 |
|  |  | -5,-1,5 |
|  |  | -5,0,0 |
|  |  | 5,-1,0 |

QUESTION 18

The height, h(x), of a punted rugby ball is given by https://content.grantham.edu/at/MA105/exams/w5_18.jpg  where x is the horizontal distance in feet from the point where the ball is punted. How far, horizontally, is the ball from the kicker when it is at its highest point?

|  |  |  |
| --- | --- | --- |
|  |  | 28 feet |
|  |  | 13 feet |
|  |  | 18 feet |
|  |  | 23 feet |
|  |  | 16 feet |

QUESTION 19

The profit P (in hundreds of dollars) that a company makes depends on the amount x (in hundreds of dollars) the company spends on advertising according to the model.

P(x) = 230 + 40x - 0.5x2

What expenditure for advertising will yield a maximum profit?

|  |  |  |
| --- | --- | --- |
|  |  | 40 |
|  |  | 0.5 |
|  |  | 230 |
|  |  | 20 |
|  |  | 115 |

QUESTION 20

The total revenue R earned per day (in dollars) from a pet-sitting service is given by

R(p) = -10p2 + 130p

where p is the price charged per pet (in dollars).

Find the price that will yield a maximum revenue.

|  |  |  |
| --- | --- | --- |
|  |  | $7.5 |
|  |  | $6.5 |
|  |  | $8.5 |
|  |  | $9.5 |
|  |  | $10.5 |