



King Abdulaziz University  
Faculty of Science  
Department of Mathematics



**Second Semester: 1442-1443 (2021-2022)**

**First Exam Math 110**

**Model: D**

**Total degree: 30**

**Date: Wednesday 20/8/1443 (23/3/2022)**

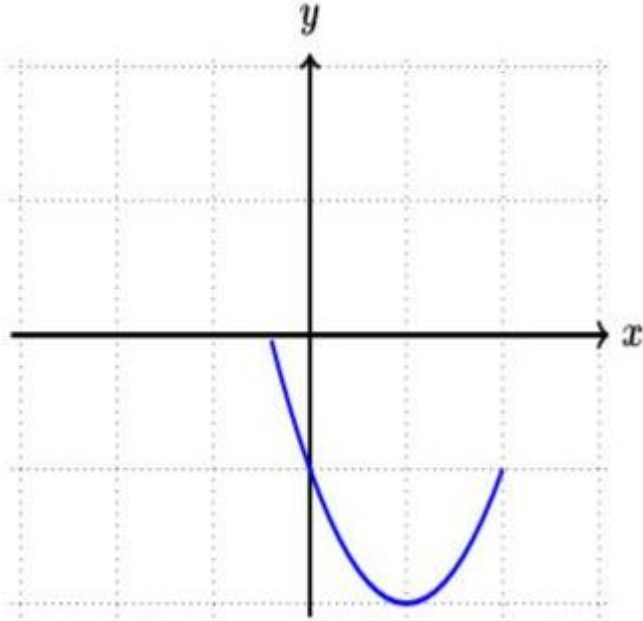
**Time: 8:00 - 9:30 AM**

**General Instructions:**

- Write your full name and university ID in the paper below.
- Read every question carefully.
- Make sure you have 30 questions.
- Each question is assigned one point.
- The time limit of the exam is 90 minutes.
- Completely circle the correct answer in your answer sheet form.
- Use only **PENCIL**.
- Please obey the rules provided by invigilators.
- The telephone and calculator are not allowed during the exam.
- The exam is closed book; no form of external aid is allowed during the exam.
- Mere suspicion of cheating will be enough to get your test withdrawn.
- Good luck on your exam.

**Name:** .....

**ID Number:** .....

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| Q1 | <p>The rang of the given graph of the function is</p>  <p>(a) <math>[-0.5, 2]</math>                      (b) <math>[-2, 0]</math> *                      (c) <math>(-2, 0)</math>                      (d) <math>(-2, 0]</math></p>   |
| Q2 | <p>The solution set of the inequality <math> 2x + 5  &gt; 3</math> is</p> <p>(a) <math>[-4, -1]</math>    (b) <math>(-\infty, -4] \cup [-1, \infty)</math></p> <p>(c) <math>(-4, -1)</math>    (d) <math>(-\infty, -4) \cup (-1, \infty)</math> *</p>  |
| Q3 | <p>The solution set of the inequality <math>-1 &lt; 2x - 5 &lt; 7</math> is</p> <p>(a) <math>(2, 6)</math> *    (b) <math>[2, 6]</math></p> <p>(c) <math>(2, 6]</math>    (d) <math>[2, 6)</math></p>  |
| Q4 | <p>The representation of the closed interval <math>[-1, 8]</math> in the set builder notation is</p> <p>(a) <math>\{x   -1 \leq x &lt; 8\}</math>    (b) <math>\{x   -1 &lt; x \leq 8\}</math></p> <p>(c) <math>\{x   -1 &lt; x &lt; 8\}</math>    (d) <math>\{x   -1 \leq x \leq 8\}</math> *</p> |
| Q5 | <p>The slope of the line parallel to the line <math>5x + 2y + 31 = 0</math> is</p> <p>(a) <math>-\frac{2}{5}</math>    (b) <math>\frac{5}{2}</math>    (c) <math>-\frac{5}{2}</math> *    (d) <math>\frac{2}{5}</math></p>                               |

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| Q6  | The slope of a vertical line is<br>(a) 0                                      (b) 1                                      (c) undefined *                                      (d) $-1$   |
| Q7  | If $f(x) = \frac{x^2+1}{3x-9} - \frac{1}{\sqrt{x-2}}$ , then the domain of the function is<br>(a) $(2,3) \cup (3, \infty)$ *                                      (b) $(2,3)$<br>(c) $(-\infty, 2] \cup [3, \infty)$ (d) $(-\infty, 2) \cup (3, \infty)$ |
| Q8  | The range of the function $f(x) = 3 - x^2$ is<br>(a) $[3, \infty)$ (b) $(-\infty, -3]$<br>(c) $[-3, \infty)$ (d) $(-\infty, 3]$ *  |
| Q9  | The range of the function $f(x) = \sin(3 + x) + 7$ is<br>(a) $(6,8)$ (b) $(-8, -6)$ (c) $[-8, -6]$ *                                      (d) $(-\infty, \infty)$  |
| Q10 | The equation of a line that through the point $(1, -4)$ with slope 2 is<br>(a) $2y + x - 6 = 0$ (b) $y - x - 4 = 0$<br>(c) $2y - 2x - 6 = 0$ (d) $y - 2x + 6 = 0$ *  |
| Q11 | The solution set of the inequality $x^2 + 2x - 8 \geq 0$ is<br>(a) $(-4,2)$ (b) $(-\infty, -4) \cup (2, \infty)$<br>(c) $[-4,2]$ (d) $(-\infty, -4] \cup [2, \infty)$ *  |
| Q12 | The given function $f(x) = \frac{x^2-3\cos x}{2x^4-x^2+5}$ is<br>(a) an even function *                                      (b) an odd and even function<br>(c) an odd function                                      (d) neither even nor odd function  |

Q13 The domain of the function  $f(x) = \frac{x-7}{\sqrt{4+x^2}}$  is

(a)  $[-2,2]$  (b)  $(-2,2)$   
 (c)  $(-\infty, -2] \cup [2, \infty)$  (d)  $(-\infty, \infty)$  \*

Q14 The following curve that represents a function is

(a)

(b)

(c) \*

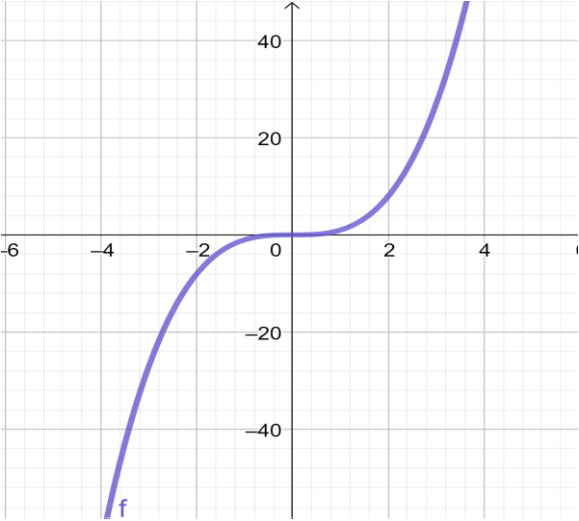
(d)

Q15 The expression  $1 - \sec^2\theta =$

(a)  $\cos^2\theta$  (b)  $\tan^2\theta$  (c)  $-\tan^2\theta$  \* (d)  $-\csc^2\theta$

Q16 The equation of the line passing through the point  $(-1,5)$  and perpendicular to the line  $3y - 7x - 5 = 0$  is

(a)  $y - 7x + 32 = 0$  (b)  $7y + 3x - 32 = 0$  \*  
 (c)  $7y - 32x - 7 = 0$  (d)  $3y + 7x + 32 = 0$

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| Q17 | <p>The distance between <math>(2, -5)</math> and <math>(-1, 4)</math> is</p> <p>(a) <math>\sqrt{24}</math>                      (b) 90                      (c) <math>\sqrt{90}</math> *                      (d) 24</p>   |
| Q18 | <p>The given function <math>f(x) = \frac{x^3 - \sqrt{2}x + \frac{1}{5}}{\pi - 6x - \frac{1}{9}x^3}</math> is</p> <p>(a) Rational function *                      (b) Root function</p> <p>(c) Power function                      (d) Polynomial function</p>  |
| Q19 | <p>The given graph of the function is symmetric about the</p> <div style="text-align: center;">  </div> <p>(a) <math>x</math> -axis                      (b) <math>y</math> -axis                      (c) origin point *                      (d) <math>y = x</math></p>       |
| Q20 | <p>The angle <math>\frac{4\pi}{3}</math> rad =</p> <p>(a) <math>240^\circ</math> *                      (b) <math>135^\circ</math>                      (c) <math>160^\circ</math>                      (d) <math>150^\circ</math></p>   |
| Q21 | <p>Let <math>f(x) = x^2</math>, then the new graph of <math>f(x)</math> is shifted to the right three units and then reflected about <math>x</math> - axis is</p> <p>(a) <math>f(x) = x^2 - 3</math>                      (b) <math>f(x) = (x + 3)^2</math></p> <p>(c) <math>f(x) = (3 - x)^2</math>                      (d) <math>f(x) = -(x - 3)^2</math> *</p> |

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| Q22 | Let $f$ be a function $f(x)$ with domain $D_f = [a, b]$ . Then the domain of the function $f(x - 1)$ is<br><br>(a) $[a, b]$ (b) $[a + 1, b + 1]$ *<br>(c) $(a - 1, b - 1)$ * (d) $(a, b)$  |
| Q23 | If $x \geq 2$ , then $ x - 2  =$<br><br>(a) $2 + x$ (b) $x - 2$ * (c) $-x - 2$ (d) $2 - x$   |
| Q24 | If $f(x) = \frac{1}{3-x}$ and $g(x) = \sqrt{x} - 2$ , then the domain of $(fg)(x)$ is<br><br>(a) $(0,3)$ (b) $[0,3]$<br>(c) $[0,3)$ (d) $[0,3) \cup (3, \infty)$ *   |
| Q25 | If $\cot(\theta) = \frac{3}{2}$ and $0 < \theta < \frac{\pi}{2}$ , then $\csc(\theta) =$<br><br>(a) $\frac{\sqrt{13}}{3}$ (b) $\frac{\sqrt{13}}{2}$ * (c) $\frac{2}{\sqrt{13}}$ (d) $\frac{3}{\sqrt{13}}$  |
| Q26 | If the function $F(x) = (2x + x^2)^4$ , then the representation of the function $F(x)$ in the form $f \circ g$ is<br><br>(a) $f(x) = 2x + x^2 ; g(x) = x^2$ (b) $f(x) = x^4 ; g(x) = 2x + x^2$ *<br>(c) $f(x) = 2x^4 ; g(x) = 2x + x^4$ (d) $f(x) = x^2 + x^4 ; g(x) = 2x$ |
| Q27 | If the function $f(x) = \begin{cases} 1 - 2x & \text{if } x \leq -1 \\ x^2 + 2x & \text{if } x > -1 \end{cases}$ . Then $f(-3) =$<br><br>(a) 3 (b) 9 (c) 7 * (d) -5  |

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| Q28 | If $\sin(\theta) = \frac{2}{5}$ where $0 < \theta < \frac{\pi}{2}$ , then $\cos(2\theta) =$<br>(a) $\frac{8}{25}$ (b) $\frac{5}{2}$ (c) $\frac{16}{25}$ (d) $\frac{17}{25}$ *                                       |
| Q29 | If $f(x) = \sqrt{3+x}$ and $g(x) = \sqrt{2-x}$ , then $(g \circ f)(x) =$<br>(a) $\sqrt{6-x}$ (b) $\sqrt{2+\sqrt{3-x}}$<br>(c) $\sqrt{2-\sqrt{3+x}}$ *                      (d) $\sqrt{x+6}$                         |
| Q30 | The domain of $(g \circ f)(x)$ if $f(x) = \sqrt{3+x}$ and $g(x) = \sqrt{2-x}$ , is<br>(a) $[-3,1]$ *                      (b) $(-\infty, -3] \cup [1, \infty)$<br>(c) $(-3,1)$ (d) $(-\infty, -3) \cup (1, \infty)$ |

With our best wishes