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GOOD LUCK!

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For grading use:

Number Correct	
	(out of 20 problems)

Total	
	(out of 100 points)

Multiple Choice Questions

*Show all your work on the page where the question appears.
Clearly mark your answer both on the cover page on this exam
and in the corresponding questions that follow.*

1. Find all distinct real solutions x to

$$7(9x + 2) = 6x + 8$$

Possibilities:

- (a) $-\frac{2}{19}$
- (b) $\frac{2}{19}$
- (c) $-\frac{2}{21}$
- (d) $-57 \pm \sqrt{19}$
- (e) 0

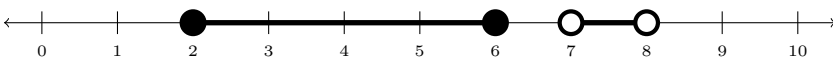
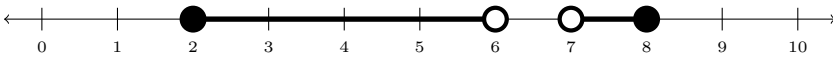
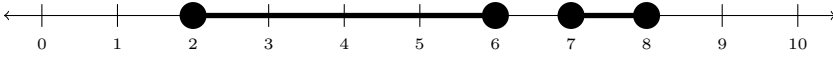
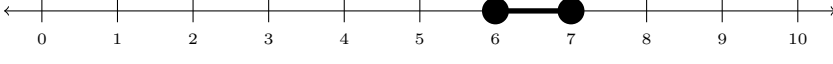
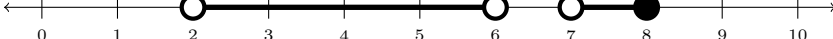
2. What is the first operation applied to x in the following expression? $7 - (9x + 2)^6$

Possibilities:

- (a) Take the 6th root
- (b) Raise it to the 6th power
- (c) Add 2
- (d) Multiply by 9
- (e) Subtract it from 7

3. Which of the following number lines represents the union of intervals $[2, 6) \cup (7, 8]$

Possibilities:

- (a) 
- (b) 
- (c) 
- (d) 
- (e) 

4. Simplify, and write the given number without using absolute values. $|\sqrt{2} - 7|$

Possibilities:

- (a) 47
 - (b) $7 + \sqrt{2}$
 - (c) $\sqrt{2} - 7$
 - (d) $-7 - \sqrt{2}$
 - (e) $7 - \sqrt{2}$
-

5. Find the distance between $-\frac{9}{11}$ and 7

Possibilities:

- (a) $\frac{68}{11}$
 - (b) $\frac{34}{11}$
 - (c) $-\frac{68}{11}$
 - (d) $\frac{43}{11}$
 - (e) $\frac{86}{11}$
-

6. Solve the equation for x .

$$A = \pi(R + x)^2 + (L + 3)(W + 5) - 15$$

Possibilities:

- (a) $x = \frac{\pm\sqrt{A} \pm \sqrt{(L + 3)(W + 5) - 15}}{\pi} - R$
 - (b) $x = \frac{-R \pm \sqrt{(L + 3)(W + 5) - 15}}{2\pi}$
 - (c) $x = \pm\sqrt{A - \pi R^2 - (L + 3)(W + 5) + 15}$
 - (d) $x = \pm\sqrt{15}$
 - (e) $x = \pm\sqrt{\frac{A - (L + 3)(W + 5) + 15}{\pi}} - R$
-

7. Solve the equation. $(x + 7)^4 + 72 = 88$

Possibilities:

- (a) -5 and -9
- (b) 81450697 and -81450553
- (c) 2473 and -2329
- (d) 2473 and -2473
- (e) -69 and -75

8. Solve for x in the equation $|9 - 7x| = 4 - 6x$

Possibilities:

- (a) 1 only
- (b) 3 only
- (c) 5 and 1
- (d) 5 only
- (e) No real solutions.

9. Solve for x in the equation $\sqrt{16x + 41} = x + 5$

Possibilities:

- (a) No real solutions.
- (b) 8 only
- (c) -2 and 8
- (d) -2 only
- (e) 6 only

10. Solve for x in $\frac{8}{x-2} + \frac{5}{x-6} = \frac{7}{(x-2)(x-6)}$

Possibilities:

- (a) 5 only
- (b) $\sqrt{8}$ and $-\sqrt{8}$
- (c) 2 and 6
- (d) $\frac{7}{13}$ only
- (e) $\frac{7}{8}$ and $\frac{7}{5}$

11. Find all distinct, real solutions to

$$\frac{x+6}{x+5} + \frac{x+8}{x+4} = 3$$

Possibilities:

- (a) $x = -\frac{9}{2}$ and $x = -2$
- (b) $x = -2 \pm \sqrt{8}$
- (c) $x = 2 \pm \sqrt{12}$
- (d) $x = -3$ and $x = -5$
- (e) No real solutions

12. Solve for x by completing the square in $x^2 + 2\pi x - 3 = 0$

Possibilities:

- (a) $3 - \pi$
- (b) $\sqrt{3 - \pi}$
- (c) $\frac{3}{1 + \pi}$
- (d) $-\pi \pm \sqrt{\pi^2 + 3}$
- (e) $\frac{3 \pm \sqrt{19^2 - \pi}}{2}$

13. Find a number k such that the equation $x^2 + kx + 17 = 0$ has exactly one real solution.

Possibilities:

- (a) $\frac{\pm\sqrt{17}}{2}$
- (b) 289
- (c) $\pm 2\sqrt{17}$
- (d) $\frac{289}{4}$
- (e) $\pm\sqrt{17}$

14. Find all distinct, real solutions x to $x^6 - 6x^3 - 11 = 0$.

Hint: You may want to complete the square, or simplify a root/fraction before finishing the problem.

Possibilities:

- (a) $\pm\sqrt{3 + \sqrt[3]{20}}$
- (b) $\pm\sqrt{3 \pm \sqrt[3]{20}}$
- (c) $\pm\sqrt[3]{3 \pm \sqrt{20}}$
- (d) $\sqrt[3]{3 \pm \sqrt{20}}$
- (e) $\pm\sqrt[3]{3 \pm \sqrt[3]{20}}$

15. Find all distinct, real solutions x to $(x^2 - 6)(x - 8)(x - 1) = 0$.

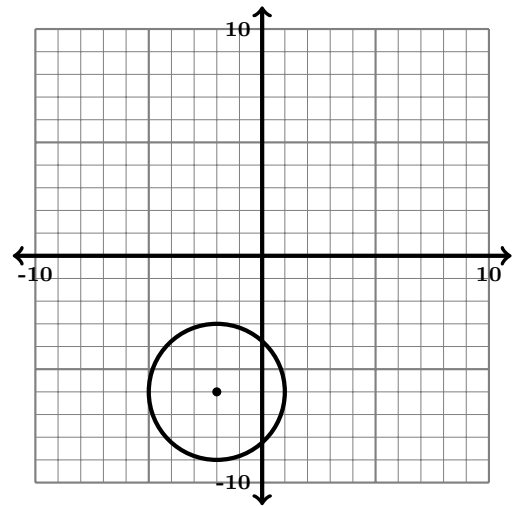
Possibilities:

- (a) $x = 6$, $x = 8$, and $x = 1$
- (b) $x = \pm\sqrt{6}$, $x = 8$, and $x = 1$
- (c) $x = \pm\sqrt{6}$, $x = -8$, and $x = -1$
- (d) $x = -6$, $x = -8$, and $x = -1$
- (e) No solution

16. Find an equation for the circle shown below:

Possibilities:

- (a) $(x + 2)^2 + (y - 6)^2 = 3$
- (b) $(x - 2)^2 + (y - 6)^2 = 9$
- (c) $(x + 2)^2 + (y + 6)^2 = 9$
- (d) $(x - 2)^2 + (y + 6)^2 = 3$
- (e) $(x + 4)^2 + (y - 12)^2 = -9$



17. The graph of $x^2 + y^2 - 14x - 18y + 126 = 0$ is a circle. Find its center and its radius.

Possibilities:

- (a) Radius: 2 Center: (7, 9)
- (b) Radius: 2 Center: (-7, -9)
- (c) Radius: 4 Center: (14, 18)
- (d) Radius: $3\sqrt{14}$ Center: (-7, -9)
- (e) Radius: $3\sqrt{14}$ Center: (7, 9)

18. What is the distance between $(6, -8)$ and $(1, -5)$?

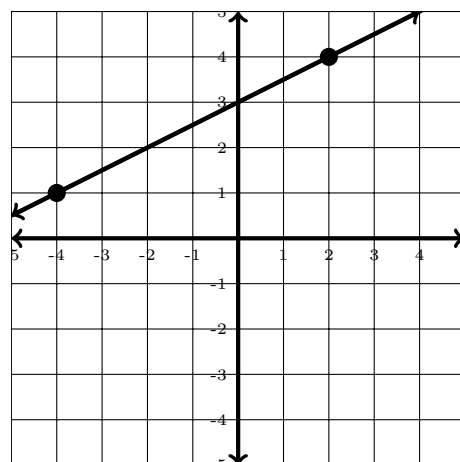
Possibilities:

- (a) $2\sqrt{58}$
- (b) $\sqrt{218}$
- (c) $\sqrt{34}$
- (d) $2\sqrt{2}$
- (e) 3

19. Find the slope of the line in the graph.

Possibilities:

- (a) 2
- (b) $\frac{1}{2}$
- (c) $-\frac{1}{2}$
- (d) -2
- (e) The slope is not defined.



20. Find an equation for the line through the points $(7, 9)$ and $(2, 6)$.

Possibilities:

- (a) $y = -\frac{5}{3}(x - 7) - 9$
- (b) $y - 9 = \frac{5}{3}(x - 7)$
- (c) $y + 9 = \frac{3}{5}(x + 7)$
- (d) $y - 9 = \frac{3}{5}(x - 7)$
- (e) $y + 9 = \frac{5}{3}(x + 7)$

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