

MATH 100

PRACTICE

FINAL EXAM

Lecture Version

Name: _____

ID Number: _____

Instructor: _____

Section: _____

Do not open this booklet until told to do so!

On the separate answer sheet, fill in your name and identification number and code the appropriate spaces with a No. 2 pencil. Use the spaces marked “Year” under Birth Date to code the version of the exam you are taking.

The exam has 50 multiple choice questions. Select the one best answer for each problem. Use a No. 2 pencil to mark your answers on the answer sheet. Be sure to clearly mark your answer with a heavy mark. Should you change an answer, be sure to erase your original answer completely.

The test booklet has a limited amount of space with each problem. If the space is not sufficient to show your work, use the back of the previous page. Label your work. Mark your answer in the exam booklet and on the answer sheet. Answer all questions. There is no penalty for guessing.

Good Luck!

1. Solve the linear equation 1._____

$$\frac{1}{5}(10x - 20) = x - 3$$

- a) $\{-1\}$ b) $\{17\}$
c) $\{3\}$ d) $\{1\}$

2. Decide whether the equation is an identity, a conditional equation, or a contradiction. 2._____

$$2(3x - 4) = 6x + 5$$

- a) identity b) conditional equation
c) contradiction d) none of these

3. The formula for the perimeter of a rectangle is given by $P = 2l + 2w$, 3._____
where l is the length and w is the width. Assume the perimeter of a rectangular plot of land is 480 ft. The length is twice the width. Find the length of the rectangular plot of land.

- a) 80 ft b) 120 ft
c) 160 ft d) 240 ft

4. A car dealership uses the linear model $y = -1100x + 25000$ to 4._____
predict the depreciation of car values as time progresses. If x is how old the vehicle is in years and y is the current value of the vehicle, what will the value of the vehicle be 5 years after purchase?

- a) \$18,400 b) \$19,500
c) \$22,700 d) \$23,900

5. Find the following sum. 5._____

$$7(3x^2 + 2x - 5) + 2(-x^2 + 3)$$

- a) $20x^2 + 14x - 32$ b) $19x^2 + 2x - 2$
c) $28x^2 + 14x - 28$ d) $19x^2 + 14x - 29$

6. Find the following product. 6._____

$$(1 - 3x)(x^2 + 2x - 5)$$

- a) $-3x^3 - 5x^2 + 17x - 5$ b) $x^2 - x - 4$
c) $-3x^3 + 7x^2 + 13x - 5$ d) $-7x^2 + 17x - 5$

7. Factor out the greatest common factor from the following polynomial. 7._____

$$3a^7b^3 - 21a^4b^3$$

- a) $a^4b^3(3a^3 - 21)$ b) $3a^4b^3(a^3 - 7)$
c) $a^4b^3(3a^3b - 21ab)$ d) $3a^4b^3(a^3b - 7ab)$

8. Factor the following polynomial by grouping. 8._____

$$15ab - 6b + 10a - 4$$

- a) $(3b + 2)(5a - 2)$ b) $(3b - 2)(5a + 2)$
c) $(3b + 2)(5a + 2)$ d) $(3b - 2)(5a - 2)$

9. Factor the following trinomial. 9._____

$$6x^2 + 11x - 10$$

- a) $(3x - 2)(2x - 5)$ b) $(3x + 2)(2x - 5)$
c) $(3x - 2)(2x + 5)$ d) $(x + 6)(11x - 10)$

23. Solve the following rational equation. 23._____

$$\frac{2}{x+3} - \frac{1}{2x+1} = \frac{8}{2x^2+7x+3}$$

- a) $\{-3\}$ b) $\{3\}$
c) $\{-\frac{1}{2}\}$ d) No solutions

24. Solve the following radical equation. 24._____

$$\sqrt{3x+13} = x+1$$

- a) $\{-3\}$ b) $\{4\}$
c) $\{-3,4\}$ d) No solutions.

25. Solve the following inequality. Write the solution set in interval notation. 25._____

$$2x+1 \leq 3x-2$$

- a) $(-\infty, -3]$ b) $[3, \infty)$
c) $(-\infty, 3]$ d) $[-3, \infty)$

26. Solve the following inequality. Write the solution set in interval notation. 26._____

$$2 \geq \frac{5-3x}{4} > -3$$

- a) $(-1, \frac{17}{3})$ b) $(-1, \frac{17}{3}]$
c) $[-1, \frac{17}{3})$ d) $[-1, \frac{17}{3}]$

27. Solve the following quadratic inequality. Write the solution set in interval notation. 27._____

$$x^2 - 2x - 35 < 0$$

- a) $(-5,7)$ b) $(-\infty, -5) \cup (7, \infty)$
c) $[-5,7]$ d) $(-\infty, -5] \cup [7, \infty)$

28. Solve the following rational inequality. Write the solution set in interval notation. 28._____

$$\frac{x + 9}{x - 6} \leq 0$$

- a) $(-9, 6]$
- b) $[-9, 6)$
- c) $(-\infty, -9) \cup [6, \infty)$
- d) $(-\infty, -9] \cup (6, \infty)$

29. Solve the following absolute value equation. 29._____

$$|2x + 11| = 7$$

- a) $\{-2\}$
- b) $\{-9\}$
- c) $\{-2, -9\}$
- d) No solutions.

30. Solve the following absolute value inequality. 30._____

$$|5x - 3| \geq -1$$

- a) No solutions.
- b) $(\frac{2}{5}, \frac{4}{5})$
- c) $(-\infty, \frac{2}{5}) \cup (\frac{4}{5}, \infty)$
- d) $(-\infty, \infty)$

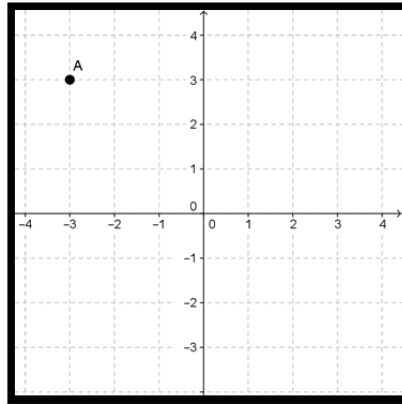
31. Given the following center-radius form of the equation for a circle, find the center of the circle. 31._____

$$(x - 3)^2 + (y + 2)^2 = 16$$

- a) $(3, 2)$
- b) $(-3, 2)$
- c) $(3, -2)$
- d) $(-3, -2)$

32. Consider the following graph of the point A.

32._____



Which quadrant does A lie in?

- a) Quadrant I
- b) Quadrant II
- c) Quadrant III
- d) Quadrant IV

33. Decide whether the following relation defines a function.

33._____

$$\{(0,1), (1,2), (-1,0), (2, -3), (3, -2)\}$$

- a) Yes, this is a function.
- b) No, this is not a function.

34. Give the domain and range of the following relation.

34._____

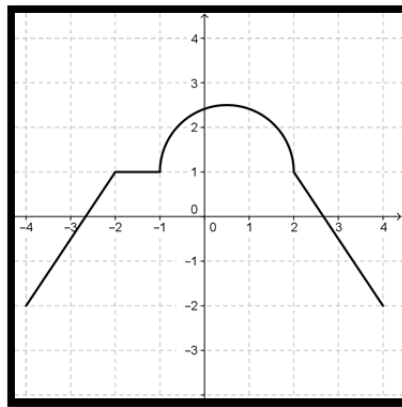
$$y = \sqrt{x - 1}$$

- a) Domain is $(-\infty, \infty)$ and Range is $(-\infty, \infty)$
- b) Domain is $[1, \infty)$ and Range is $(0, \infty)$
- c) Domain is $(1, \infty)$ and Range is $[0, \infty)$
- d) Domain is $[1, \infty)$ and Range is $[0, \infty)$

35. For the function $f(x) = 3x^2 - 7$, find $f(-3)$. 35._____

- a) -34
- b) 20
- c) -16
- d) 2

36. Determine the intervals of the domain for which the following function 36._____ is decreasing.

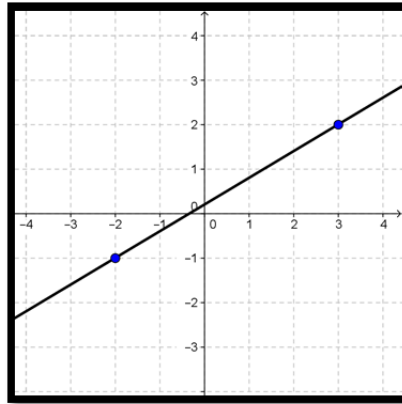


- a) $[-4, -2] \cup [-1, 0.5]$
- b) $[-2, -1]$
- c) $[0.5, 4]$
- d) $[-2, 2.5]$

37. Which of the following pairs of points has slope $2/9$? 37._____

- a) (1,3) and (2, -7)
- b) (1,2) and (3, -7)
- c) (2,3) and (-7,1)
- d) (3,1) and (-7,2)

38. Given the following graph of a linear function, what is the slope? 38._____



- a) $3/5$
- b) $5/3$
- c) $-3/5$
- d) $-5/3$

39. Write the equation of the line passing through the point $(-3,7)$ with slope zero. 39._____

- a) $x = -3$
- b) $y = -3$
- c) $x = 7$
- d) $y = 7$

40. Write the equation in slope-intercept form for a line passing through the point $(-3,2)$ that is parallel to $4x - y = 7$. 40._____

- a) $y = 4x + 14$
- b) $y = -4x - 10$
- c) $y = -\frac{1}{4}x + \frac{5}{4}$
- d) $y = \frac{1}{4}x + \frac{11}{4}$

41. The following table lists data collected during a recent experiment. In this case, x represents age (in years) and y represents the given diameter (in inches). 41._____

x	1	3	5	7	9	11	13
y	5.73	6.44	7.01	7.67	8.23	9.11	9.85

Use the linear regression feature on your graphing calculator to find a line of best fit for this data. Use the equation you found to predict the diameter given an age of 6 years.

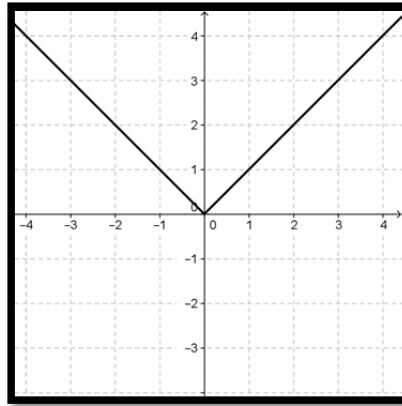
- a) 7.38 inches b) 1.91 inches
c) 1.06 inches d) 7.04 inches
42. For the following piecewise-defined function, find $f(-1)$. 42._____

$$f(x) = \begin{cases} 1 - 5x & \text{if } x < -2 \\ x^2 - 2x & \text{if } -2 \leq x \leq 1 \\ -1 + 2x & \text{if } x > 1 \end{cases}$$

- a) -3 b) -1
c) 3 d) 6

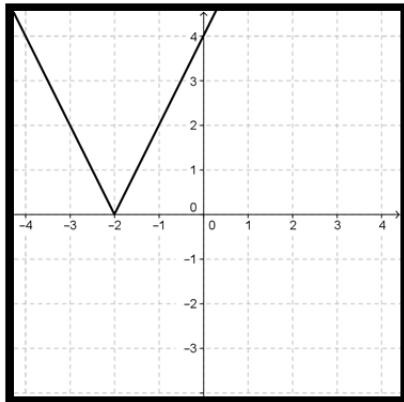
43. The following is a graph of $y = f(x)$.

43. _____

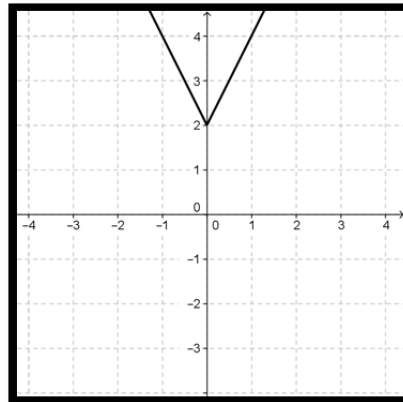


Which is the graph of $y = 2f(x) - 2$?

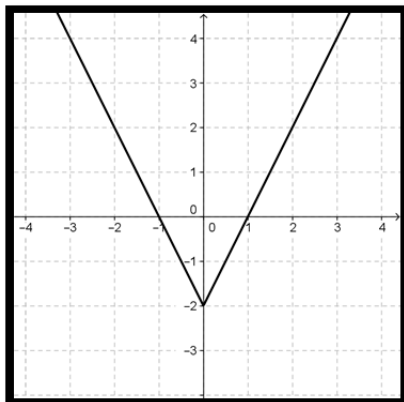
a)



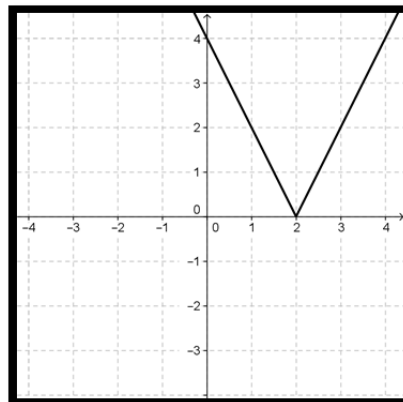
b)



c)



d)



44. Suppose that the point (1,4) is on the graph of $y = f(x)$. Find a point on the graph when y is translated left 3 units and reflected across the x -axis. 44. _____

a) (1, -4)

b) (4, -4)

c) (-2,4)

d) (-2, -4)

45. Decide which of the following functions is even. 45. _____

a) $f(x) = |x|$

b) $f(x) = x + 1$

c) $f(x) = \sqrt{x}$

d) $f(x) = x^3$

46. Let $f(x) = 3x^2 - 1$ and $g(x) = -2x + 7$. Find $(f + g)(-3)$. 46. _____

a) 27

b) 39

c) -41

d) -14

47. Use the following table to evaluate $(f/g)(2)$. 47. _____

x	$f(x)$	$g(x)$
-1	2	7
0	0	-1
2	-3	4
8	5	2

a) $-3/4$

b) $-1/8$

c) $7/5$

d) $5/7$

48. For the function $f(x) = -3x + 4$, find and simplify 48. _____

$$\frac{f(x+h) - f(x)}{h}$$

a) $-3x + 4$

b) $-3x - 3h + 4$

c) $-3h$

d) -3

49. Use the following table to evaluate $(g \circ f)(-1)$.

49._____

x	$f(x)$	$g(x)$
-3	5	-1
-1	-3	5
5	8	-3
8	-1	8

a) -3

b) -1

c) 5

d) 8

50. Let $f(x) = -2x^2 + 1$ and $g(x) = 4x - 3$. Find $(f \circ g)(x)$.

50._____

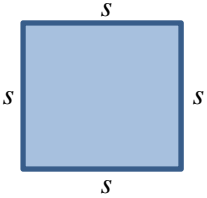
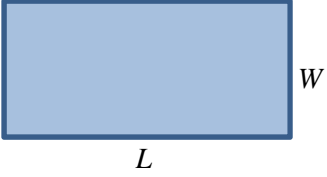
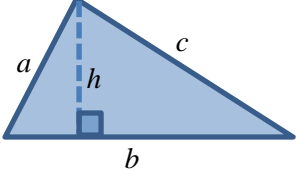
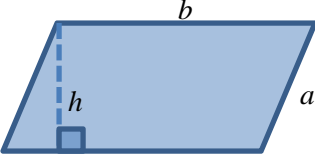
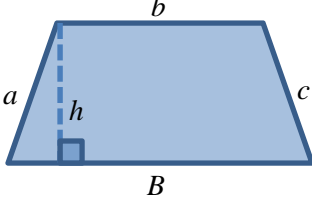
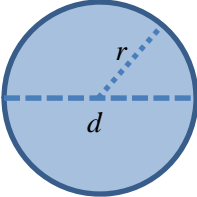
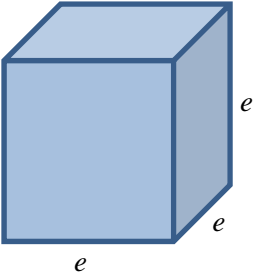
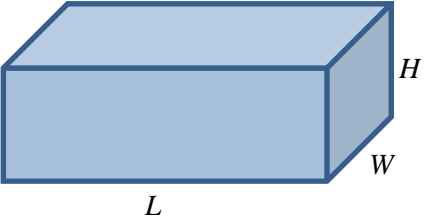
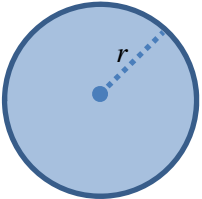
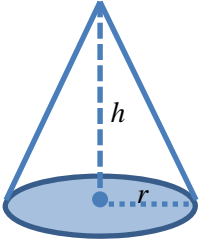
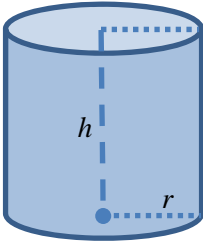
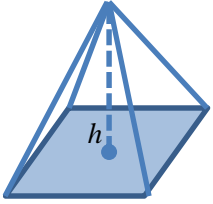
a) $-8x^3 + 6x^2 + 4x - 3$

b) $-2x^2 + 4x - 2$

c) $-8x^2 + 5$

d) $-32x^2 + 48x - 17$

Geometry Formulas

<p>Square Perimeter: $P = 4s$ Area: $A = s^2$</p> 	<p>Rectangle Perimeter: $P = 2L + 2W$ Area: $A = LW$</p> 	<p>Triangle Perimeter: $P = a + b + c$ Area: $A = \frac{1}{2}bh$</p> 
<p>Parallelogram Perimeter: $P = 2a + 2b$ Area: $A = bh$</p> 	<p>Trapezoid Perimeter: $P = a + b + c + B$ Area: $A = \frac{1}{2}h(b + B)$</p> 	<p>Circle Diameter: $d = 2r$ Circumference: $C = 2\pi r = \pi d$ Area: $A = \pi r^2$</p> 
<p>Cube Volume: $V = e^3$ Surface Area: $S = 6e^2$</p> 	<p>Rectangular Solid Volume: $V = LWH$ Surface Area: $S = 2HW + 2LW + 2LH$</p> 	<p>Sphere Volume: $V = \frac{4}{3}\pi r^3$ Surface Area: $S = 4\pi r^2$</p> 
<p>Cone Volume: $V = \frac{1}{3}\pi r^2 h$ Surface Area: $S = \pi r\sqrt{r^2 + h^2}$ <i>(excludes the base)</i></p> 	<p>Right Circular Cylinder Volume: $V = \pi r^2 h$ Surface Area: $S = 2\pi r h + 2\pi r^2$ <i>(includes top and bottom)</i></p> 	<p>Right Pyramid Volume: $V = \frac{1}{3}Bh$ <i>B = area of the base</i></p> 

Answer Key:

1. D	11. D	21. D	31. C	41. A
2. C	12. D	22. A	32. B	42. C
3. C	13. A	23. B	33. A	43. C
4. B	14. C	24. B	34. D	44. D
5. D	15. C	25. B	35. B	45. A
6. A	16. D	26. C	36. C	46. B
7. B	17. C	27. A	37. C	47. A
8. A	18. A	28. B	38. A	48. D
9. C	19. B	29. C	39. D	49. B
10. B	20. B	30. D	40. A	50. D