

## Math 107 online practice test 2

Your exam will contain 20 questions selected from the following problem types.

1. Find the midpoint of the line segment connecting the pair of points (3,-6) and (1,-2).
2. Find the center and radius of the circle defined by the equation  $x^2 + y^2 - 4x + 6y - 10 = 0$
3. Find the equation of the circle which has center (-7,4) and radius 9.
4. Find the distance between the points (3,-6) and (1,-2).
5. Explain what is meant in mathematics by a *function*.
6. For the function  $f$ , where  $f(x) = \frac{3x^2 - 6x}{4 - 2x^2}$ , evaluate  $f(-5)$ .
7. For the function  $f$ , where  $f(x) = x^2 - 2x - 5$ , simplify  $f(a - h)$
8. Find the equation of the linear function which has slope -5 and y-intercept (0,-4)
9. Find the equation of the linear function which passes through the points (0,5) and (-3, 20)
10. Solve by completing the square:  $x^2 + 6x - 11 = 0$
11. State the quadratic formula.
12. Solve the quadratic equation  $3x^2 + 6x - 7 = 0$
13. Solve:  $\sqrt{3 - 5x} - 22 = -12$
14. Solve:  $\sqrt{x - 2} + \sqrt{x} = 9$
15. Solve:  $(2x + 3)^2 - 3(2x + 3) - 4 = 0$
16. Solve:  $\left(\frac{3x + 2}{2x - 5}\right)^2 - 3\left(\frac{3x + 2}{2x - 5}\right) = 10$
17. Solve:  $-2(4 - 3x) - 12x > 7$
18. Solve:  $(3x - 4)(2 - 5x) < 0$
19. Solve:  $x^2 - 5x < 14$
20. Solve:  $-4 < 5 - (2x - 3) < 7$
21. Sketch graphs of relations which illustrate symmetry w.r.t.  
(a) the y-axis.

- (b) the x-axis.
- (c) the origin.
- (d) the y-axis, x-axis and origin.

22. Test the relation  $x^3 + y^2 = 7$  for symmetry with respect to the x-axis and the y-axis.
23. On a single set of axes, draw the graphs of  $f(x) = x^2$  and  $g(x) = (x - 2)^2$ .
24. Given  $f(x) = 3x - 7$  and  $g(x) = 3x^2 + 2x - 4$ , find
- (a)  $(f - g)(-3)$
  - (b)  $(gf)(x)$
25. Given  $f(x) = 3x - 7$  and  $g(x) = 3x^2 - 2x + 4$ , find
- (a)  $f \circ g(-2)$
  - (b)  $f \circ g(x)$
26. Describe the effect on the graph of  $y = f(x)$  of the following transformations:
- (a)  $y = f(x - 3)$
  - (b)  $y = -2f(x)$
27. If the ordered pair  $(-2, 3)$  lies on the graph of  $y = f(x)$ , find an ordered pair on the graph of the transformed function  $y = -3f(x - 2) + 7$ .
28. The graph of the function  $y = f(x)$  is drawn below. draw a graph of the transformed function  $y = -2f(x - 3) + 2$ .

