F1510501

MAT 1050 FINAL EXAM – FALL 2015

SHOW ALL WORK. DO NOT USE A CALCULATOR.

1. (7 pts.) Simplify by adding (or subtracting) like terms wherever possible:

$$a^3 + 2b^2 + \pi\sqrt{2} - \frac{2}{3}b^2 - 3\sqrt{2} + \frac{2}{3}b^3$$

2. (7 pts.) Simplify completely: $\left(\frac{-3x^0}{y^2 z^{-3}}\right)^2 x^{-3} y^4 z$

3. (7 pts.) Simplify completely: $\left(2\sqrt{3} + \sqrt{2}\right)\left(2\sqrt{3} - 5\sqrt{2}\right)$

4. (7 pts.) Simplify completely: $\frac{8^{\frac{2}{3}} + 9^{-\frac{1}{2}}}{8^{\frac{2}{3}} - 9^{-\frac{1}{2}}}$

5. (6 pts.) Let $f(x) = 6 - \left|\frac{2-x}{5}\right|$. Find all $\boldsymbol{x}$ such that $f(x) = 8$.

6. (6 pts.) Solve: $|2m + 4| - 13 \le 13$

7. (7 pts.) Stan has 14 fewer marbles than Kenny. Kenny has half as many marbles as Eric. Together the three have 198 marbles. How many marbles does each boy have?

8. (7 pts.) Solve for D: $A + \frac{C}{D} = \frac{2}{A}$

9. (6 pts.) Let $\boldsymbol{f}$ be the function given by $f(x) = \frac{x^2 - 9}{\sqrt{2x-4}}$.

   What is the domain of $\boldsymbol{f}$?

10. (6 pts.) Let $\boldsymbol{g}$ be the function given by $g(x) = \frac{\sqrt{6-x}}{x^2}$.

    a) Find and simplify $g(-3)$.

    b) Find and simplify $g(3-a)$.

11. (7 pts.) Let f be the function given by $f(x) = 2x^2 - 7x + 1$.

    Find and simplify $\dfrac{f(x) - f(x-h)}{h}$.

12. (6 pts.) Find the equation of the line that is parallel to the y-axis and goes through the point $(-1, 7)$.

13. (6 pts.) Find the equation of the line that is perpendicular to the line $y - 2x = -5$ and goes through the point $(2, -8)$.

14. (7 pts.) A wire, which is 20 feet long, runs from the top of an antenna to a stake in the ground. The height of the antenna is the same as the distance from the base of the antenna to the stake. How high is the antenna?

15. (7 pts.) Solve, writing any non-real solutions in the form $a + bi$: $(x+4)(x+2) = -4$

16. (7 pts.) Graph, labeling the vertex and all x and y intercepts: $f(x) = x^2 - 6x - 7$

17. (7 pts.) Simplify completely: $\dfrac{\dfrac{2}{x+1} - 2}{2 + \dfrac{4}{x+1}}$

18. (7 pts.) Solve: $\sqrt{7 - x} + 5 = x$

19. (7 pts.) Solve: $x^2(4 - x) \le 0$

20. (7 pts.) Solve: $\dfrac{3}{x-2} \ge 1$

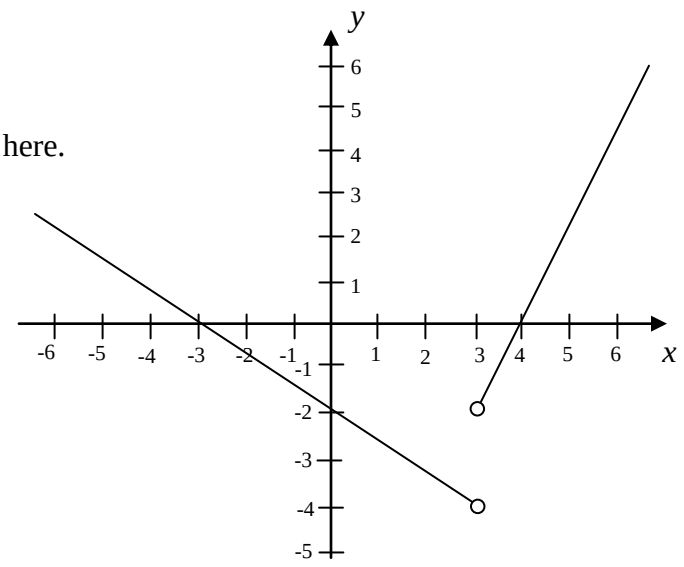
21. (7 pts.) The graph of a function, g, is shown here.

    a) What is the domain of g?

    b) What is the range of g?

    c) For what input(s), x, is $g(x) = 0$?

    d) What is the value of $g(0)$?



22. (7 pts.) Solve: $t - 5t^{\frac{1}{2}} = 36$

23. (6 pts.) Find: a) $\log_5(25)$ b) $\log_7\left(\sqrt{7}\right)$ c) $\log(.001)$

24. (6 pts.) Using the approximate values $\log_7(4) = 0.7$ and $\log_7(10) = 1.2$ find:

a) $\log_7(0.4)$ b) $\log_7(1000)$ c) $\log_7(28)$

25. (7 pts.) Solve: $\log_6(2-x) + \log_6(1-x) = 1$

26. (7 pts.) Identify and sketch the curve given by $x^2 - 4x + 3 + y^2 = 0$.

27. (7 pts.) Arrange the following numbers in order from smallest to largest:

$\sin(6.2)$ $\cos(6.2)$ $-\sqrt{2}$ $\tan(3\pi)$

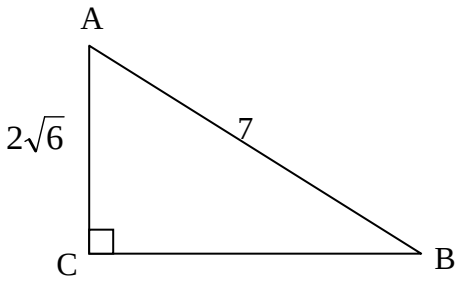
28. (6 pts.) a) Convert $3\pi^\circ$ to radians.

b) Convert 10 radians to degrees.

29. (6 pts.) For the right triangle shown here, find:

a) $\cos(\angle A)$

b) $\tan(\angle B)$



30. (7 pts.) On her drive to campus, Lila travels the first 10 miles at a constant speed. Hitting heavy traffic, she is forced to travel the remaining 15 miles at a rate that is half her original speed. If the entire trip took 1 hour, how fast did Lila drive during the first 10 miles?