W1810501

MAT 1050 GROUP FINAL EXAM – Winter 2018

SHOW ALL WORK. DO NOT USE A CALCULATOR.

1. (8 pts.) Simplify by adding (or subtracting) like terms wherever possible:

$$3\sqrt{x-1}+y^2-2y-\pi\sqrt{x-1}-5y^2+2^y$$

2. (8 pts.) Simplify completely: $\left(\sqrt[4]{\frac{32a^{-2}b^3}{c^{-5}}}\right)^{-1}\cdot\left(\sqrt[4]{\frac{2a^6b^{-5}}{c^{11}}}\right)$

3. (8 pts.) Multiply and simplify completely: $\sqrt{2}\left(\sqrt{8}-3\right)^2$

4. (8 pts.) Simplify completely: $\left(\frac{81^{-\frac{3}{4}}+9^{-\frac{1}{2}}}{9^{-\frac{1}{2}}}\right)^2$

5. (9 pts.) Solve: $|2x-3|=|7-3x|$

6. (8 pts.) On the 30 question physics exam, correct answers are worth 5 points, incorrect answers are worth -2 points and unanswered questions are worth 0 points. Pat answers 23 of the questions and scores 73. How many questions did Pat answer correctly?

7. (8 pts.) Solve for *m*: $\frac{2}{m}-\frac{k}{r}=r$

8. (8 pts.) Let f be the function given by $f(x)=\frac{x}{x^2-9}$. What is the domain of f?

9. (9 pts.) Let g be the function given by $g(x)=-x^3+\frac{x-5}{x}$.

   Find and simplify $g(-5)-g(5)$.

10. (8 pts.) Let f be the function given by $f(x)=4-3x^2$.

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

11. (8 pts.) Find the equation of the line that is parallel to $-5y=x$ and passes through the point $(-2,0)$.

12. (9 pts.) The base of a 12-ft. ladder is placed 3 ft. away from a wall. Find the exact height the ladder will reach when leaned against the wall.

13. (8 pts.) Solve, writing any non-real solutions in the form $a+bi$: $4x\left(\frac{1}{2}x-1\right)=-2x-5$

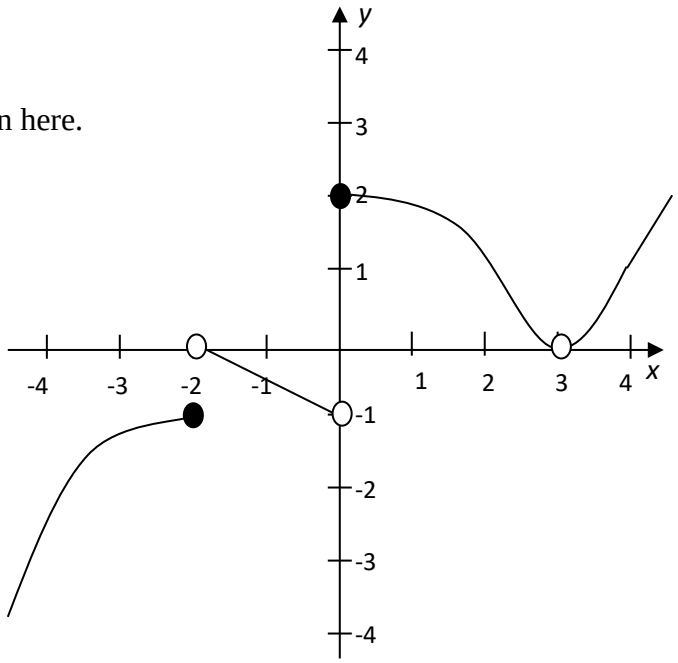
14. (8 pts.) Graph, labeling the vertex and all *x* and *y* intercepts: $-2f(x)=4x^2-8x-12$

15. (8 pts.) Simplify completely: $\dfrac{\dfrac{a}{a+b}+\dfrac{a}{a-b}}{\dfrac{b}{a-b}-\dfrac{a}{b-a}}$

16. (8 pts.) Let $f(x)=\sqrt{5-2x}-7$. Find all inputs, *x*, such that $f(x)=-3$.

17. (9 pts.) Solve: $\frac{x}{x+7}\leq\frac{2}{x-3}$

18. (8 pts.) The graph of a function, *f* , is shown here.



a) What is the domain of *f* ?

b) What is the range of *f* ?

c) What is *f* (0)?

d) Find all x such that *f*(*x*)= –1.

19. (9 pts.) Solve: $\frac{1}{x}-\frac{8}{\sqrt{x}}=-15$

20. (9 pts.) Using the approximate values $\log_5(9)=1.365$ and $\log_5(27)=2.048$ find:

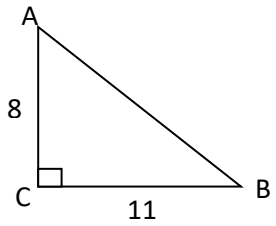
a) $\log_5(45)$ b) $\log_5\left(\frac{1}{3}\right)$ c) $\log_5(81)$

21. (8 pts.) Solve: $\log_2(x^2-3x-6)-\log_2(x)=1$

22. (8 pts.) Arrange the following numbers in order from smallest to largest:

$\sin\left(\frac{\pi}{2}\right)$ $\cos(182°)$ $\log_3\left(\frac{1}{9}\right)$ $\tan(-3\pi)$

23. (9 pts.) In the triangle shown find:



a) $\tan(<A)$

b) $\cos(<B)$

24. (9 pts.) A train and a plane both leave at the same time to travel to a city that is 360 miles away. The plane travels three times as fast as the train. The plane arrives 4 hours before the train. How fast is the train?