

NAT PRACTICE TEST General Mathematics

Name: _____ Grade & Section: _____

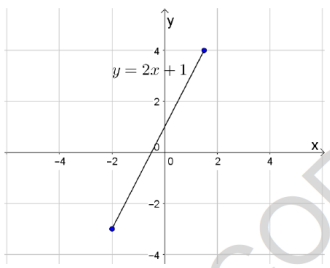
School: _____ Date: _____

Directions: Read each question carefully. Select the best answer by shading the appropriate circle on your answer sheet.

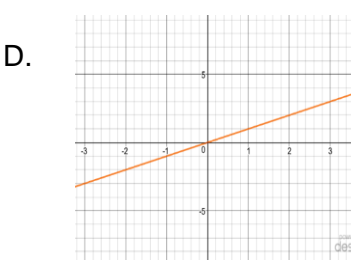
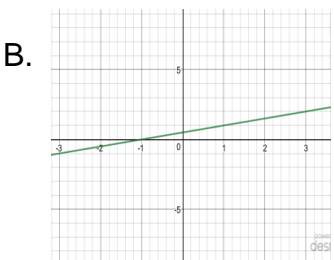
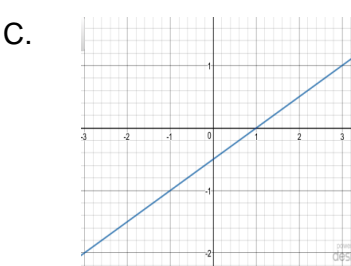
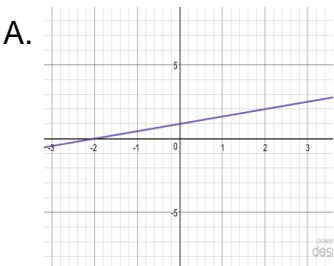
1. Joshua currently lives in Surigao City, but he begins a new job in Butuan City. Every Monday, he drives his new car 123 kilometers from his residence to the office and spends the week in a company apartment. He drives back home every Friday. After 4 weeks of this routinary activity, his car's odometer shows that he has travelled 1134 kilometers since he bought the car. Write a linear model which gives the distance y covered by the car as a function of x number of weeks since he used the car.
 A. $y = 246x + 150$ B. $y = 123x + 510$ C. $y = 246x + 510$ D. $y = 123x + 150$
2. If $f(x) = x + 8$, evaluate $f(2)$.
 A. 4 B. 6 C. 10 D. 16
3. Given $f(x) = 2x^2 - 5x - 8$ and $g(x) = 10x + 7$. Find $(f + g)(x)$.
 A. $2x^2 + 5x + 15$ B. $2x^2 - 5x - 1$ C. $2x^2 + 5x - 1$ D. $2x^2 - 5x + 1$
4. Three kilos of squid can be purchased at the market for PhP 180. What will be the cost of 15 kilos of squid?
 A. PhP 900 B. PhP 450 C. PhP 2700 D. PhP 1350
5. Which of the following is a rational function?
 A. $\frac{15}{\sqrt{x-1}}$ B. $\frac{7x^3 - 4\sqrt{x} + 1}{x^2 + 3}$ C. $(x - 2)^{1/2} = 4$ D. $\frac{5 - x^3}{x}$
6. Solve for x : $\frac{2}{x} - \frac{3}{2x} = \frac{1}{5}$
 A. 2 B. 2.5 C. 3 D. 3.5
7. Find the domain of $(x) = \frac{x}{x(x-3)}$.
 A. $D = \{x \mid x \neq 0 \text{ and } x \neq 3\}$ C. $D = \{x \mid x \neq 3 \text{ and } x \neq -3\}$
 B. $D = \{x \mid x \neq 1 \text{ and } x \neq -1\}$ D. $D = \{x \mid x \neq -1 \text{ and } x \neq 1\}$
8. Which of the following functions does **NOT** have a horizontal asymptote?
 A. $f(x) = \frac{x-5}{x+15}$ B. $f(x) = \frac{x^2-25}{x^2-9}$ C. $f(x) = \frac{1}{x^2+2x-15}$ D. $f(x) = \frac{x^2-11x+24}{2x-5}$
9. The amount (in percent) of a drug in a person's bloodstream h hours after its injection can be approximated using the functional rule $A(h) = \frac{5h}{4h^2+5}$. Find the approximate amount of a drug in a person's bloodstream after its injection past 3 hours.
 A. 24% B. 37% C. 52% D. 71%
10. Which of the following is an example of a one-to-one function?
 A. Books to authors C. SIM cards to cell phone number
 B. Learners to teachers D. True or False questions to answers
11. Find the inverse of $f(x) = x + 4$.
 A. $f(x) = x - 4$ C. $f(x) = x + 4$
 B. $f^{-1}(x) = x + 4$ D. $f^{-1}(x) = x - 4$



12. The graph of $f(x) = 2x + 1$ is shown below.



Which of the following is the graph of its inverse?



13. What is the domain of the inverse of $A = \{(-4,3), (2, -4), (3,1), 0,2)\}$?
 A. $\{3,4,2\}$ B. $\{-4,2,3,0\}$ C. $\{3,-4,1,2\}$ D. $\{3,4,2,0\}$

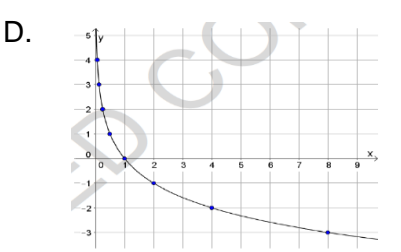
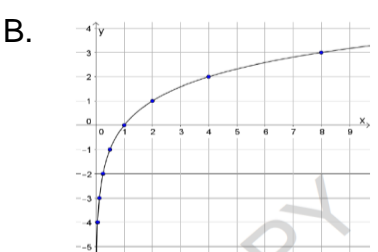
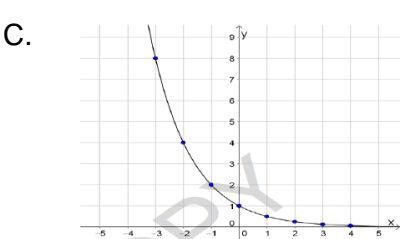
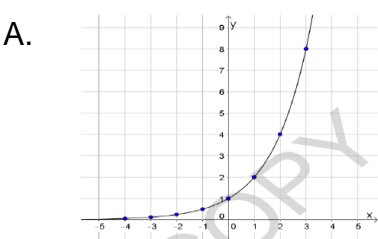
14. Engineers have determined that the maximum force t in tons that a particular bridge can carry is related to the distance d in meters between its supports by the function $(d) = (\frac{12.5}{d})^3$. Construct an inverse function to determine the result.

A. $d(t) = (\frac{12.5}{\sqrt[3]{t}})$ B. $d(t) = (\frac{12.5}{t})^3$ C. $t(d) = (\frac{12.5}{\sqrt[3]{3}})$ D. $t(d) = (\frac{12.5}{d})^3$

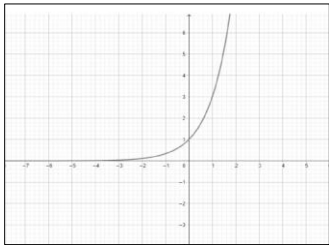
15. Which of the following is **NOT** an exponential function?
 A. $y = e^x$ B. $f(x) = 2x^3$ C. $f(x) = 2^x$ D. $2^2(5^{x+1}) = 500$

16. What is the value of x in the equation $4^{x-1} = 16$.
 A. 1 B. 3 C. 8 D.16

17. Which of the following is the graph of the exponential function $f(x) = 2^x$?



18. What is the domain of the exponential function represented by the graph at the right?



- A. $\{x \mid x \in \mathbb{R}\}$
C. $\{x \mid x \in \mathbb{R}, x \leq 0\}$
- B. $\{x \mid x \in \mathbb{R}, x < 0\}$
D. $\{x \mid x \in \mathbb{R}, x \geq 0\}$

19. Relate the graph of $y = 2^{x+4} + 1$ to the graph of $y = 2^x$. Which of the following statements is **NOT** true?

- A. The graph is increasing.
C. The graph shifts to the left by 4 units.
- B. The graph shifts up by 1 unit.
D. The horizontal shift is 4 units to the right.

20. You took out a Php20,000 loan at a 5% interest rate. If the interest is compounded annually, give an exponential model for the situation.

- A. $A = 20000(0.05)^t$
C. $A = 20000(t)^{0.05}$
- B. $A = 20000(1.05)^t$
D. $A = 20000(t)^{1.05}$

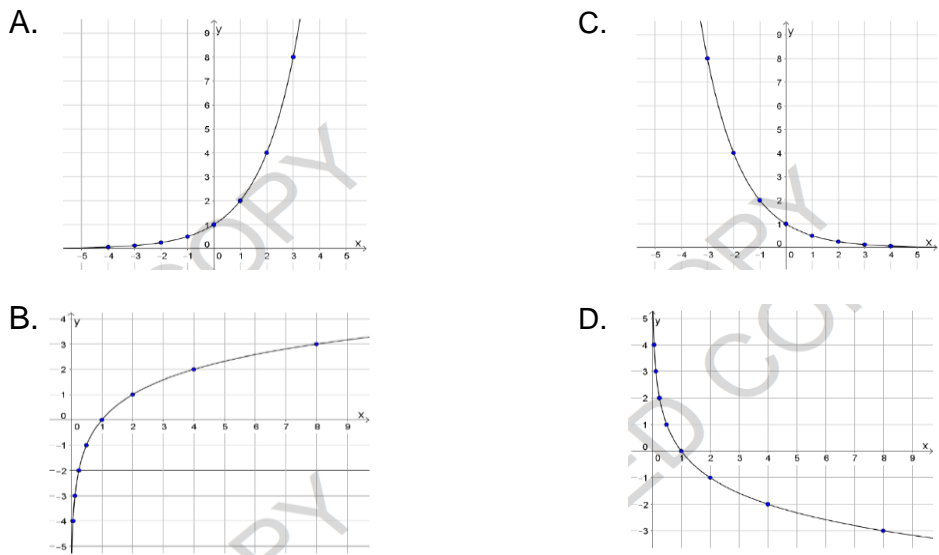
21. Which of the following does **NOT** belong to the group?

- A. $2 = y$
B. $\ln \ln x^2 > (\ln x)^2$
C. $g(x) = x$
D. $f(x) = 25$

22. Find the value of x in $(2x) = 10$.

- A. 4
B. 5
C. 20
D. 40

23. Which of the following is the graph of the logarithmic function $y = x$?



24. What is the domain of the function $f(x) = \log (x)$?

- A. $(0, +\infty)$
B. $(-\infty, +\infty)$
C. $(-\infty, 0)$
D. $(-1, 1)$

25. Which function does **NOT** have a graph with asymptote $y = 0$?

- A. $f(x) = 3^x$
B. $f(x) = (0.25)^{x+2}$
C. $f(x) = \log 6x$
D. $f(x) = \frac{1}{1+e^{-2x}}$

26. Suppose you deposit money in an investment account that pays 7% annual interest compounded continuously. About how many years will it take for your initial deposit to double?

- A. 5
B. 7
C. 9
D. 10



27. What is the difference between simple and compound interest?
- Simple yields higher interest than compound interest.
 - Simple interest is always better than compound interest.
 - Simple interest has a shorter term than compound interest.
 - Simple interest is computed based on the principal while compound interest is computed based on the principal and also on the accumulated past interests.
28. Juan borrowed from Pedro PhP 1,000 at an annual interest rate of 10%. After a year, Juan should pay PhP1,100. However, Juan failed to pay. At the end of another year, Pedro asks for PhP 1200.00. What type of interest is employed in the situation?
- Complicated
 - Compound
 - Simple
 - Structured
29. PhP 50,000 is borrowed for 9 months at an annual interest rate of 10%. In computing for the interest, what should be the value of t ?
- 0.75
 - 1
 - 3
 - 9
30. PhP 10,000 was borrowed at 2% interest rate payable for 3 years. It yielded a total interest of PhP600.00. How much is its future value?
- PhP 10,200
 - PhP 10,600
 - PhP 11,800
 - PhP16,000
31. A sum of money at simple interest amounts to PhP 815 in 3 years and to PhP 854 in 4 years. The sum is:
- PhP 650
 - PhP 690
 - PhP 698
 - PhP 700
32. Reese deposited PhP 7500 for two years into a money market account. At the end of two years, she had a total of PhP 8700. What rate of interest did she receive?
- 6.5%
 - 7%
 - 7.5%
 - 8%
33. What type of annuity is involved when the interest conversion or compounding period is equal or the same as the payment interval?
- Annuity certain
 - Annuity uncertain
 - Simple annuity
 - General annuity
34. Suppose Mrs. Santos would like to save PhP3,000 every month in a fund that gives 9% compounded monthly. How much is the amount or future value of her savings after 6 months?
- PhP9,067.66
 - PhP12,135.67
 - PhP15,226.69
 - PhP18,340.89
- For Items 35-36. Mr. Lopez paid PhP200,000 as down payment for a car. The remaining amount is to be settled by paying PhP16,200 at the end of each month for 5 years.
35. If interest is 10.5%, what is the present value of this ordinary annuity?
- PhP375,207.2
 - PhP537,270.2
 - PhP753,702.2
 - PhP775,320.2
36. How much is the cash value of the car?
- PhP575,207.2
 - PhP537,270.2
 - PhP953,702.2
 - PhP975,320.2
37. On his 40th birthday, Mr. Ramos decided to buy a pension plan for himself. This plan will allow him to claim PhP10,000 quarterly for 5 years starting 3 months after his 60th birthday. What one-time payment should he make on his 40th birthday to pay off this pension plan, if the interest rate is 8% compounded quarterly?
- PhP33,538.38
 - PhP33,835.83
 - PhP38,335.38
 - PhP38,853.38



38. Which of the following statements illustrate a stock?
- A form of debt financing, or raising money by borrowing from investors.
 - Investors are guaranteed interest payments and a return of their money at the maturity date.
 - A form of equity financing or raising money by allowing investors to be part owners of the company.
 - It can be appropriate for retirees (because of the guaranteed fixed income) or for those who need the money soon.
39. The theory of efficient markets says that stock prices already reflect all the available information about the stock. This means that stock prices are 'accurate' - they already give a correct measure of the value of a stock precisely because the prices are already based on all information and expectation about the stock. Which of the following describes the strong form of the theory?
- Information (public and private) are incorporated in the price.
 - Doing a fundamental analysis (gathering all public data) will not lead to systematic profits.
 - Stock prices already reflect all past market trading data and historical information only. Thus, knowing past data will not give investors an edge.
 - Stock prices already reflect all publicly available data, including those involving the product, management team, financial statement, competitors and industry.
40. _____ loans are loans given to individuals for personal or family purpose.
- Business
 - Consumer
 - Corporate
 - Individual
41. Which of the following is **NOT** an example of a business loan?
- Mr. and Mrs. Craig want to borrow money from the bank to finance the college education of their son.
 - Roan has a computer shop. She owns 6 computers. She decided to borrow some money from the bank to buy 10 more computers.
 - Mr. Agustin plans to have a barbershop. He wants to borrow some money from the bank in order for him to buy the equipment and furniture for the barbershop.
 - Mr. Samson owns a siomai food cart business. He wants to put another food cart on a new mall in the other city. He decided to have a loan to establish the new business.
42. Mr. Garcia borrowed PhP1,000,000 for the expansion of his business. The effective rate of interest is 7%. The loan is to be repaid in full after one year. How much is to be paid after one year?
- PhP1,007,000
 - PhP1,070,000
 - PhP1,700,000
 - PhP17,000,000
43. A person borrowed PhP1,200,000 for the purchase of a car. If his monthly payment is PhP31,000 on a 5-year mortgage, find the total amount of interest.
- PhP660,000
 - PhP1,200,000
 - PhP1,860,000
 - PhP1,231,000
44. Which of the following is **NOT** a proposition?
- Smile at your seatmate.
 - Jose Rizal is our national hero.
 - If an integer is even, then its square is also even.
 - Ferdinand Magellan did not arrive the Philippines in 1521.
45. The conjunction of a proposition is denoted by _____.
- $\sim p$
 - $p \vee q$
 - $p \wedge q$
 - $p \rightarrow q$



46. Which of the following propositions is false?
- If $2 > 0$, then there are more than 100 million Filipinos.
 - If Daisy is in Grade 12, then she is working as a lawyer.
 - If $2 > 0$, then there are only 5 languages spoken in the Philippines.
 - Daryl has a degree in Psychology if and only if she believes in love.
47. State the converse of the conditional: $p \rightarrow q$: **"If Jose is in Grade 11, then she is a senior high school student."**
- $p \rightarrow q$: "If Jose is a senior high school student, then she is in Grade 11."
 - $q \rightarrow p$: "If Jose is a senior high school student, then she is in Grade 11."
 - $\sim q \rightarrow \sim p$: "If Jose is not a senior high school student, then she is not in Grade 11."
 - $\sim p \rightarrow \sim q$: "If Jose is not a senior high school student, then she is not in Grade 11."
48. An argument in which the premises are true but the conclusion is false is called _____.
 A. Fallacy B. Proposition C. Tautology D. Valid Argument
49. Which of the following arguments is valid?
- Either Alvin sings or dances with Nina.
Alvin sang with Nina.
Therefore, Alvin did not dance with Nina.
 - Either Alvin sings or dances with Nina.
Alvin did not dance with Nina.
Therefore, Alvin sang with Nina.
 - It is not true that Alvin sings and dances with Nina.
Alvin did not sing with Nina.
Therefore, Alvin danced with Nina.
- A. II only B. I and III C. II and III D. D. I, II, and III
50. Which of the following statements is the correct "If and only if" form of: **A binomial is a polynomial with exactly two terms.**
- A binomial has exactly two terms if and only if it is a polynomial.
 - A binomial is a polynomial if and only if it has exactly two terms.
 - A polynomial has exactly two terms if and only if it is a binomial.
 - A polynomial is a binomial if and only if it has exactly two terms.

