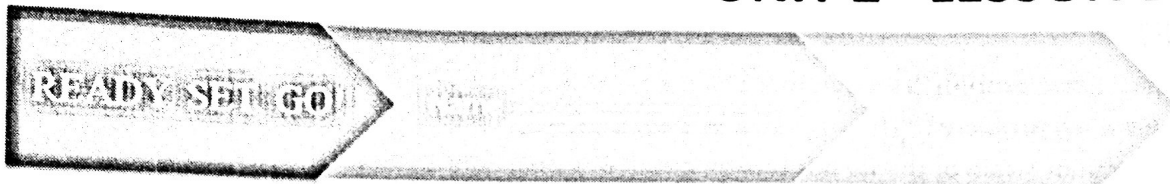


UNIT 2 - LESSON 10



READY

Topic: Solve problems involving simple interest/interest compounded annually

Solve each problem. Make your thinking visible.

1. Nigel borrowed \$400 from his brother to be repaid with 8% simple interest. Find the amount Nigel pays to his brother.

$$400(1.08) = \$432$$

2. Veronique bought a painting at auction. After the auction house collects a 6.25% simple interest charge on the sale of the painting, Veronique paid \$4972.50. Find the actual price of the painting before the auction house charge.

$$P(1.0625) = 4972.50$$
$$P = \$4680$$

3. Xian invested \$1200 in an account paying 4% interest compounded annually. How much money was in the account after 6 years?

$$1200 \left(1 + \frac{0.04}{1}\right)^6 = 21518.38$$

4. Regina bought a statue 12 years ago for \$3000. Over that time, the value of the statue has increased by an estimated 8% each year. What is the value of the statue today?

$$3000(1.08)^{12} = \$7554.51$$

5. When Boris decided to change banks, he withdrew his entire \$3825.98 balance from the account. The account had been paying 6% compounded annually for the last 12 years. How much money did Boris put into the account back at the beginning?

$$3825.98 = P(1.06)^{12}$$
$$\$1901.39 = P$$

6. Pinter deposited \$500 into an account paying 3% interest compounded annually. How much interest did Pinter earn from the account after 8 years?

$$500(1.03)^8 = \$633.39$$

Interest earned: $633.39 - 500 = \$133.39$

SET

Topic: Solve exponential equations using logarithms

Solve each problem.

7. A minor strain of the flu has broken out at Regional High School. The flu is spreading according to the model $y = 12(2^{x-5})$, where y represents the number of students infected with the flu, and x represents the number of days that have passed since the first infected student came to school. When the number of infected students reaches 984 students, or half the school, administration will have to cancel classes. After how many days will the school have to cancel classes?

$$984 = 12(2^{x-5})$$

$$82 = 2^{x-5}$$

$$\log_2 82 = x-5$$

$$11.3576 = x$$

8. Lucian is a ranger at Montehoopo State Park. The park has just finished restoring a lake and is preparing to stock the lake for fishing. Visitors to the park can begin fishing once the population has reached 800 fish. The trout being introduced into the lake is expected to double in population each year. If park officials stock the lake with 340 trout, how long will it take for the population to reach 800 (to the nearest month)?

$$800 = 340(2)^t$$

$$\frac{800}{340} = 2^t$$

$$\log_2 \left(\frac{800}{340}\right) = t$$

1.2345 = t
or 14.8136 months

Solve each equation. Express your answers to the nearest thousandth.

9. $5^{x-4} = 15625$

$$\log_5 15625 = x-4$$

$$\log_5 15625 + 4 = x$$

$$10 = x$$

12. $6^{2x-3} = 496$

$$\log_6 496 = 2x-3$$

$$3.2520 = x$$

10. $3^{2x+1} = 2187$

$$\log_3 2187 = 2x+1$$

$$3 = x$$

13. $7 + 2^{9-x} = 244$

$$2^{9-x} = 237$$

$$\log_2 237 = 9-x$$

$$1.1113 = x$$

11. $4^{12-5x} = 2048$

$$\log_4 2048 = 12-5x$$

$$1.3 = x$$

14. $3(5^{2x-3}) = 1866$

$$5^{2x-3} = 622$$

$$\log_5 622 = 2x-3$$

$$3.4985 = x$$

15. $5(3^{7-2x}) + 8 = 783$

$$5(3^{7-2x}) = 775$$

$$3^{7-2x} = 155$$

$$\log_3 155 = 7-2x$$

$$1.2406 = x$$

16. $242 = 7(3^{4x-5})^{-3}$
 $245 = 7(3^{4x-5})$
 $35 = 3^{4x-5}$
 GO $\log_3 35 = 4x-5 \dots 2.0591 = x$

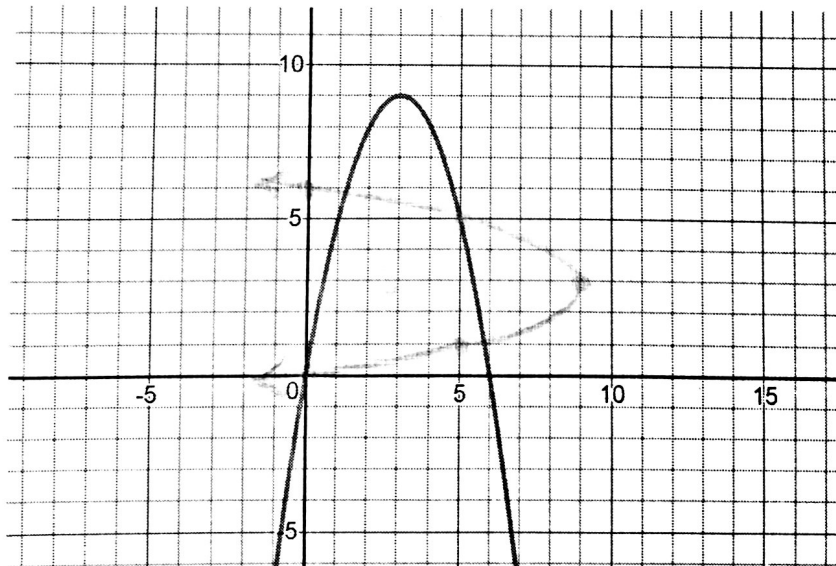
Topic: Find the inverse of a function given various representations.
 Express the inverse of each function given below.

17. $f(x) = \frac{2}{3}x + 8$ $f^{-1}(x) = \frac{3}{2}(x-8)$

18.

x	$f(x)$		x	$f^{-1}(x)$
-2	-58		-58	-2
2	142		142	2
4	242		242	4

19.



20. $f(x) = (x+5)^2$ $f^{-1}(x) = \pm\sqrt{x} - 5$

SECONDARY MATH III // UNIT 2
Inverse & Exponential Functions – Lesson 10

21. $f(x) = x^2 - 10$ $f^{-1}(x) = \pm\sqrt{x+10}$

22. $f(x) = 7^x$ $f^{-1}(x) = \log_7 x$

23. $f(x) = \log_5(x)$ $f^{-1}(x) = 5^x$

24. $f(x) = \log_4(7x)$ $f^{-1}(x) = \frac{4^x}{7}$