

Unit 5 Review (continued)

Solving Logarithmic Equations

- ① base of log = base of expo
- ② log = exponent

EX3. $\log_5(3x+11) = 4$

$$5^4 = 3x + 11$$

$$625 = 3x + 11$$

$$\begin{array}{r} -11 \qquad -11 \\ \hline \end{array}$$

$$\frac{614}{3} = \frac{3x}{3}$$

$$x = 204.\bar{6}$$

EX4. $\log 6x - \log 3 = 2$

$$\log\left(\frac{6x}{3}\right) = 2$$

$$\log(2x) = 2$$

$$10^2 = 2x$$

$$\frac{100}{2} = \frac{2x}{2}$$

$$x = 50$$

Exponential Growth and Decay

EX7. Ryan's motorcycle is now worth \$2500. It has decreased in value 12% each year since it was purchased. If he bought it four years ago, what did it cost new?

$$y = a \cdot b^x$$

end ↑ *Start* ↑ *%* ↑ *x* ← *time*

$$\begin{array}{r} 100 \\ - 12 \\ \hline 88 \end{array}$$

↻

$$2500 = a(0.88)^4$$
$$\frac{2500}{0.60} = \frac{a(0.60)}{0.60}$$

$$a = \$4166.67$$

Compound Interest

$$A = Pe^{rt}$$

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

EX8. What amount will an account have after 18 years if \$250 is invested at 5% interest compounded semiannually?

$$0.05$$

$$A =$$

$$P = 250$$

$$r = 0.05$$

$$n = 2$$

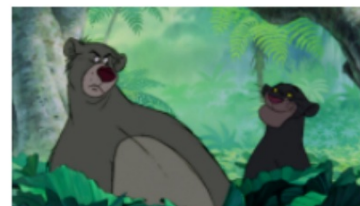
$$t = 18$$

$$A = 250 \left(1 + \frac{0.05}{2}\right)^{2(18)}$$

$$A = \$608.13$$

Unit 6 Bare Necessities - Circles and Trig

Equation of a Circle



EX1. $(x-3)^2 + (y-5)^2 = 81$

Center: $(3, 5)$

radius: $\sqrt{81} = 9$

EX2. $x^2 + y^2 + 12x - 4y + 31 = 0$

$$x^2 + \underbrace{12x}_{+36} + y^2 + \underbrace{-4y}_{+4} = -31$$
$$\frac{12}{2} = (6)^2 = 36 \quad \frac{-4}{2} = (-2)^2 = 4$$

$$(x+6)^2 + (y-2)^2 = 9$$

Center: $(-6, 2)$ radius: 3

Equations of Sine and Cosine

EX3. $y = -3\cos\left(\frac{\pi}{6}x\right) + 2$

Amplitude = 3

Period = $\frac{2\pi}{\frac{\pi}{6}} = \frac{\pi}{3}$

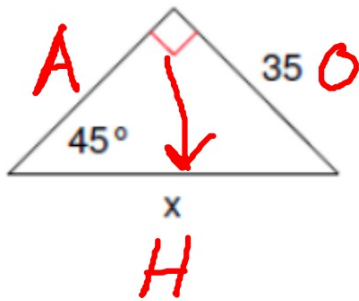
Vertical Shift = up 2

Right Triangle Trig

SO
SH CA TA

EX5.

EX4.

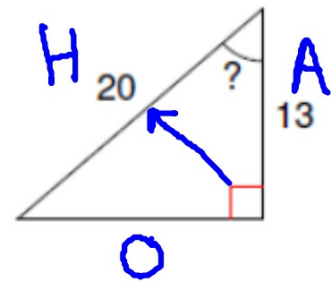


$$\frac{x \cdot \sin 45 = 35}{\sin 45 \quad \sin 45}$$

$$\sin x = \frac{\text{opp}}{\text{hyp}}$$

$$x = 49.50$$

~~$$\frac{\sin 45}{1} = \frac{35}{x}$$~~



$$\cos x = \frac{\text{adj}}{\text{hyp}}$$

$$\cos x = \frac{13}{20}$$

$$\cos^{-1}(13/20) = 49.45^\circ$$