Worksheet on Derivatives

Name: _____

On this work sheet you do not have to write the answers in the form of sentences. Just fill in the answers as indicated. You may have to do some of the calculations on a different sheet.

1. $f(x) = 3x^7 - 9x^4 + 13x^3 - 9x^2 + 3x - 7$

$f'(x) =$

2. $A = s^2$

$\frac{dA}{ds} =$

3. $x) = 5\sqrt{x}$

$f'(x) =$

4. $g(t) = -6.3t^\pi$

$g'(t) =$

5. $V = \frac{4\pi}{3}r^3$

$\frac{dV}{dr} =$

6. $A = 4\pi r^3$

$\frac{dA}{dr} =$

7. $V = \left(\sqrt{\frac{A}{6}}\right)^3$

$\frac{dV}{dA} =$

8. $u(s) = 3s - \frac{5}{s^2}$

$u'(s) =$

9. $y = \sqrt[5]{x}$

$\frac{dy}{dx} =$

10. $u(x) = \frac{3x - 12x^2}{x^3}$

$u'(x) =$

11. $f(x) = \frac{3}{\sqrt[7]{x}}$

$f'(x) =$

12. $T = \cos\theta$

$\frac{dT}{d\theta} =$

13. $A = \frac{1}{2}b\sin\theta$ (b a constant)

$\frac{dA}{d\theta} =$

14. $F(z) = \frac{4}{z^4} - 3\tan z$

$F'(z) =$

15. $T(\alpha) = 32\tan\alpha - 3\cos\alpha$

$T'(\alpha) =$

16. $H(s) = \sin(s) + 2\cos(s) = 3\tan(s)$

$H'(s) =$

17. $f(t) = 4^t$
$f'(t) =$

18. $I(n) = P_0(1+r)^n$ P_0 and r constants
$I'(n) =$

19. $A = 2\pi 5^r$
$\dfrac{dA}{dr} =$

20. $y = \frac{3}{7^x} + \cos x - \sqrt{x}$
$y' =$

1. The surface area A and volume V of a sphere of radius r are $A = 4\pi r^2$, $V = \frac{4}{3}\pi r^3$.

   (a) Find a formula for V in terms of A.

   (b) Compute the derivative $\dfrac{dV}{dA}$.

   (c) The volume of a ball of radius 4in is increased by .5in^3. Estimate the increase in the area.

2. The side of a cube is measured to be 10in with an error of $\pm.01$in. Approximate the error in using $10^3 = 1000$in^3 as volume of the cube.