

CALCULUS SUMMER WORK

Name: _____

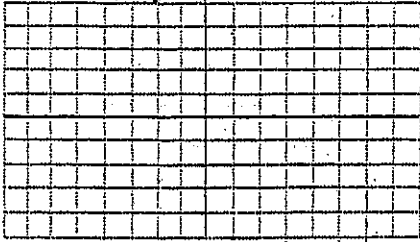
These worksheets contain practice problems that will help you review and get ready for Calculus in the fall.

- Solve all problems, showing work to justify your answers. You may need to attach extra paper.
- Bring the completed packet to the first day of class next year.
- If you don't remember how to do a particular type of problem, you can find help online at sites such as Khan Academy (<http://www.khanacademy.org/>), Hippocampus (<http://www.hippocampus.org/Algebra>) and WebMath (<http://www.webmath.com/>).

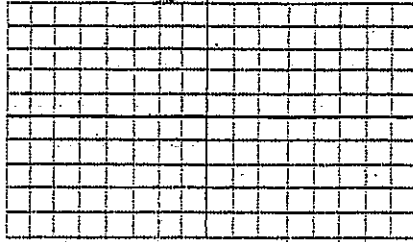
Calculus Graphing Basic Functions

Sketch each of the following; label all asymptotes and intercepts.

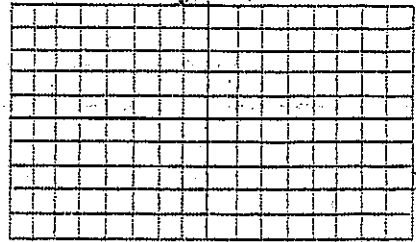
$$y = x^3$$



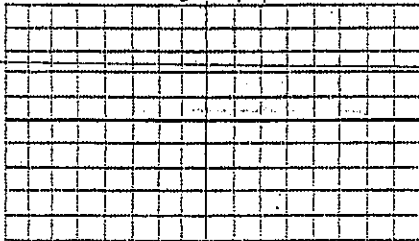
$$y = 1/x$$



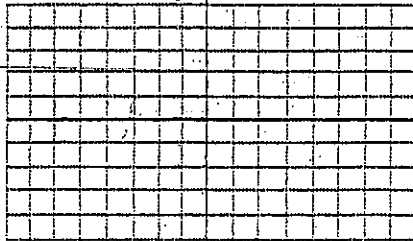
$$y = \sqrt{x}$$



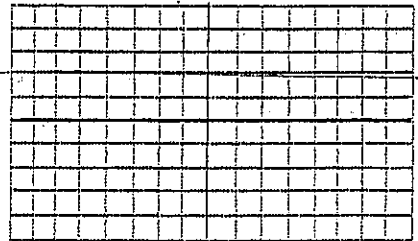
$$y = |x|$$



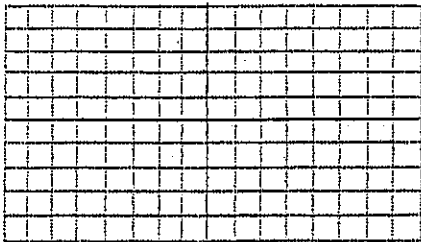
$$y = x^2$$



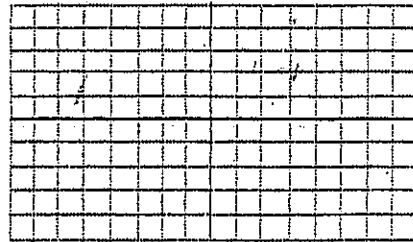
$$y = 4$$



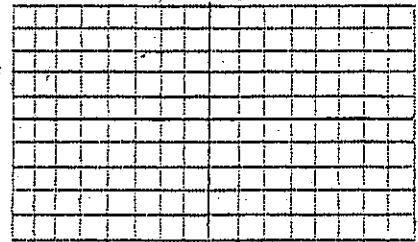
$$y = \cos(x)$$



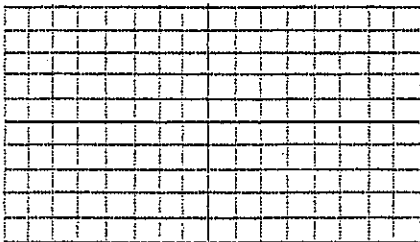
$$y = \sin(x)$$



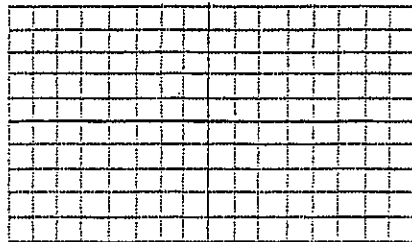
$$x = y^2$$



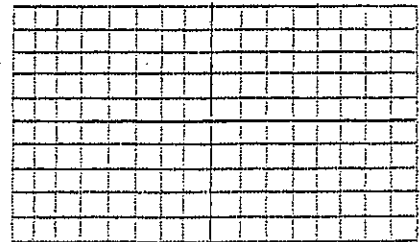
$$y = x$$



$$y = \sqrt[3]{x}$$

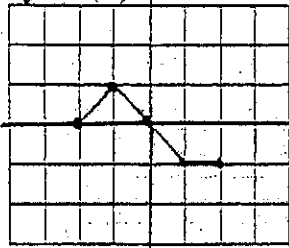


$$x = -5$$

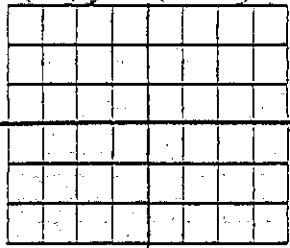


Use the graph of $y = f(x)$ to produce graphs that correspond to the given functions:

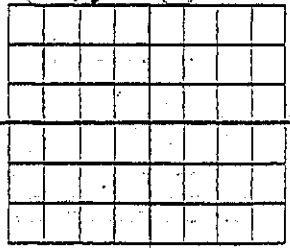
$y = f(x)$



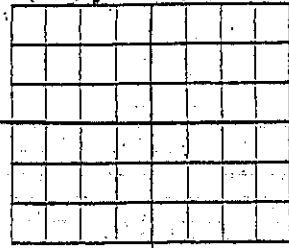
(24) $y = f(x + 1)$



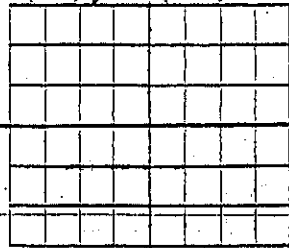
(25) $y = f(x) + 1$



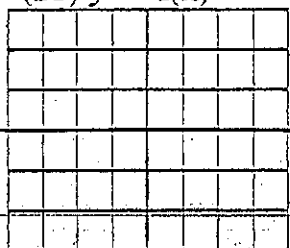
(26) $y = 2f(x)$



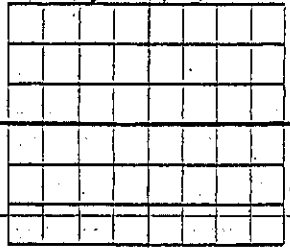
(27) $y = f(x/2)$



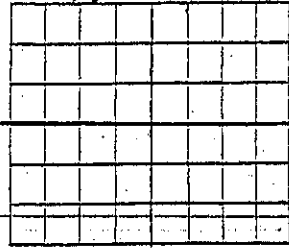
(28) $y = -f(x)$



(29) $y = f(-x)$



(30) $y = f(x-1) + 2$



SKILLS PRACTICE 102

For use with Section 13-3
Definitions of Trigonometric and
Circular Functions

Find the exact value of the six trigonometric functions.

1. 225°

2. -90°

3. 315°

4. -120°

5. 240°

6. -330°

Find the exact value of the six circular functions.

7. $\frac{5\pi}{2}$

8. $\frac{-\pi}{4}$

9. $\frac{-2\pi}{3}$

10. $\frac{3\pi}{4}$

11. $\frac{7\pi}{6}$

12. $\frac{-\pi}{2}$

SKILLS PRACTICE 13

For use with Section 3-4

Equations of Linear Functions from Their Graphs

NAME _____

DATE _____

- a. Write the particular equation of the line described.
 - b. If necessary, transform it to the slope-intercept form.
 - c. Transform it to the $Ax + By = C$ form, where A , B , and C are integers.
1. Has a y-intercept of -3 and a slope of -2
 2. Through $(2, -3)$ and a slope of 8
 3. Through $(1, 6)$ and $(3, 9)$
 4. Through $(2, -3)$ and parallel to $y = 3x - 5$
 5. Through $(2, -3)$ and perpendicular to $y = -\frac{3}{4}x + 4$
 6. Has a y-intercept of 5 and a slope of $\frac{2}{3}$
 7. Through $(-3, 4)$ and a slope of -2.5
 8. Through $(-3, 3)$ and $(7, -12)$
 9. Through $(-4, 3)$ and parallel to $y = -\frac{3}{4}x + 4$
 10. Through $(-4, 3)$ and perpendicular to $y = 3x - 5$

SKILLS PRACTICE 18

For use with Section 4-4

$f(x)$ Terminology, and Systems as Models

NAME _____

DATE _____

Let $f(x) = 2x - 5$
 $g(x) = 7 - 3x$
 $h(x) = 4 - 3x + x^2$

Evaluate.

- | | | | |
|--------------------------------|---------------|----------------|----------------|
| 1. $f(4)$ | 2. $g(-3)$ | 3. $h(2)$ | 4. $f(-5)$ |
| 5. $g\left(\frac{4}{3}\right)$ | 6. $h(-5)$ | 7. $f(0)$ | 8. $g(2)$ |
| 9. $h(-1)$ | 10. $f(5)$ | 11. $g(0)$ | 12. $h(-3)$ |
| 13. $h(0)$ | 14. $g(-5)$ | 15. $f(g(2))$ | 16. $g(h(-3))$ |
| 17. $f(h(2))$ | 18. $h(g(1))$ | 19. $g(f(-1))$ | 20. $f(f(-2))$ |
| 21. $f(a)$ | 22. $h(r)$ | 23. $g(m)$ | 24. $f(a + b)$ |
| 25. $g(2 + a)$ | 26. $g(f(x))$ | 27. $f(g(x))$ | 28. $g(g(x))$ |

29. **A Rematch of the Fabled Race Problem** Coming off an embarrassing loss to the tortoise, the hare wanted a rematch. The tortoise, being a wise old animal, agreed to race again if he was given a 30-minute lead. Both start at the same point. The tortoise races at a constant speed of 50 feet per minute and the hare races at a constant speed of 160 feet per minute.

Let: x = number of minutes since the tortoise started.

$T(x)$ = number of feet the tortoise has gone.

$H(x)$ = number of feet the hare has gone.

- Write particular equations expressing $T(x)$ in terms of x and $H(x)$ in terms of x .
- Find $T(35)$ and $H(35)$. Who is ahead at the end of 35 minutes?
- When will the hare catch up with the tortoise? How far from the starting point?
- Before starting, the two animals agreed that the race would be 2000 feet. Who won? By how many feet?

SKILLS PRACTICE 37

For use with Section 6-4

Exponentiation for Rational Exponents

NAME _____

DATE _____

Evaluate on the calculator.

1. $\sqrt[3]{97}$

2. $\sqrt[3]{650}$

3. $\sqrt[4]{25}$

4. $\sqrt[6]{856}$

5. $\sqrt[3]{9587}$

6. $\sqrt[4]{1324}$

Simplify. Write answers as products of powers with no variables in the denominator.

7. $5x^2 \cdot 3x^{-4}$

8. $7x^{-5} \cdot 5x^{-6}$

9. $10x^{-3} \cdot 3x^{10}$

10. $(-3x)^2 (-2x^{-4}y^2)^3$

11. $(6x^3y^{-2})^2 (3x^{-5}y^3)^2$

12. $(12x^3y^{-4}) \div (20x^5y^{-4})$

13. $\frac{6}{x^{-4}} + \frac{5}{x^{-2}}$

14. $\frac{x^{-4}y^3}{x^{-6}y^2}$

15. $\frac{15x^2y^{-4}z^{-3}}{45x^{-3}y^5z^{-3}}$

16. $(267x^{53})^{-81} \cdot (267x^{53})^{81}$

17. $12x^{-\frac{3}{4}} \cdot 6x^{\frac{2}{3}}$

18. $\sqrt[3]{x^{20}y^8}$

19. $\sqrt[6]{64x^{12}y^{-8}}$

20. $6x^{\frac{2}{5}} \div 3x^{\frac{3}{4}}$

SKILLS PRACTICE 60
For use with Section 7-10
Fractional Equations and Extraneous
Solutions

NAME _____

DATE _____

Solve by factoring.

1. $x^2 - 14x + 40 = 0$

2. $x^2 - 8x - 7 = 0$

3. $2x^2 - x - 15 = 0$

4. $5x^2 - 25 = 0$

5. $6x^2 - 11x + 4 = 0$

6. $x^2 - 3x - 40 = 0$

7. $2x^2 + x - 1 = 0$

8. $x^2 - 9x + 7 = 0$

9. $x^2 + 6x + 5 = 0$

10. $3x^2 + 2x - 3 = 0$

State the domain and solve. Show any discarded solutions.

11. $\frac{x-3}{x} - \frac{2}{x} = \frac{4}{3}$

12. $\frac{2}{x+3} = \frac{4}{x-2}$

SKILLS PRACTICE 30

For use with Section 5-5
Evaluating Quadratic Functions

1. Suppose $f(x) = 2x^2 - 6x + 3$.

a. Find $f(-2)$.

b. Find $f(5)$.

c. Find x , if $f(x) = 4$.

d. Find the x -intercepts.

2. Suppose $f(x) = -3x^2 + 6x - 4$.

a. Find $f(-3)$.

b. Find $f(4)$.

c. Find the x -intercepts.

d. Find the $f(x)$ intercept.

e. Find x , if $f(x) = -2$.