Accuplacer – College Level Math Practice Test

Tutorial Services – Mission del Paso Campus

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1. **Factor the Following Polynomials**

    a. $6x^5 - 8x^4 + 2x^3$ b. $x^2 - 25$ c. $x^3 + 27$

    d.   ab + 3a + 2b + 6   e. $2x^2 + 9x - 5$ f. $x^2 + 6x + 9$

2. **Perform the indicated operation**

    a. $(3x +7y) + (4x^2 - 3x + 7) + (y - 1)$ d. $(4x^2 - 6xy + 9y^2) - (8x^2 - 6xy - y^2)$

    b. $(x -4)(2x + 9)$ e. $\dfrac{3x^5 yb^9}{9xy^7}$

    c. $(-3xa + 4b)^2$ f. $\dfrac{3x^4 - 25x^2 - 20}{x - 3}$

3. **Simplify the following Expressions**

    a. $3(5 - 7)^4$ c. $45 - 6^2 \div 3^2 + \sqrt{1}$

    b. $\dfrac{-6 + |3 - 5|}{2}$ d. $\sqrt{\dfrac{1}{4}} + \sqrt{\dfrac{9}{4}}$

4. **Solve Each Linear Equation**

    a. $2(x + 3) = x + 5$ c. $P = 2L + 2W$ solve for W

    b. $\dfrac{x}{2} + \dfrac{2}{3} = \dfrac{3}{4}$ d. $\dfrac{m - 4}{3} - \dfrac{3m - 1}{5} = 1$

5. **Solve each word problem**

    a. Maria rode her bicycle at an average speed of 18 mph on level roads and then slowed down to 10mph on the hilly roads of the trip. The entire trip covered 98 miles. How long did the entire trip take if traveling the level roads took the same time as traveling the hilly roads? {Remember, **d = r·t** }

    b. The bottom of Jim's backpack contains 20 coins in nickels and dimes. If the coins have a total value of $1.85, find the number of each type of coin.

    c. The sum of three consecutive integers is 13 more than twice the smallest integer. Find the integers.

    d. Laura invested $24,000 in two accounts: a mutual fund paying 8% annual interest and a CD paying 9% annual interest. If her annual interest was $2,020 how much did she invest in each account?

6. Solve the Following Quadratic Equations

    a. $m^2 + 5m - 6 = 0$ b. $(x + 5)(x - 1) = 2$

    c. $\dfrac{1}{8}x^2 + x = \dfrac{5}{2}$ d. $x^2 + 7x + 4 = 0$

7. Solve the following Radical Equations

    a. $\sqrt{2x - 3} = 9$ b. $\sqrt[3]{x + 1} + 5 = 3$

    c. $\sqrt{4 - x} = x - 2$ d. $\sqrt{2x + 5} + \sqrt{2x} = 3$

8. Rational Expressions: Perform the indicated operation

    a. $\dfrac{5}{x^2 - 3x} \div \dfrac{4}{2x - 6}$ b. $\dfrac{x}{2x + 6} + \dfrac{5}{x^2 - 9}$

    c. $\dfrac{a^2 - 9}{a - 6} \bullet \dfrac{a^2 - 5a - 6}{a^2 - a - 6}$ d. $\dfrac{3}{4a - 8} - \dfrac{a + 2}{a^2 - 2a}$

9. Rational Expressions: Solve the following equations

    a. $\dfrac{x}{2} - \dfrac{x}{3} = 12$ b. $7 + \dfrac{6}{a} = 5$

    c. $\dfrac{6}{x + 3} = \dfrac{4}{x - 3}$ d. $2 + \dfrac{3}{x} = \dfrac{2x}{x + 3}$

10. Solve the following absolute value equations

    a. $\left| \dfrac{x}{2} - 1 \right| = 11$ b. $\left| \dfrac{3x + 1}{2} \right| = -2$

    c. $|2x| + 5 = 7$ d. $|3x + 2| = |5x - 8|$

11. Exponents & Radicals: Simplify

    a. $\sqrt{32}$ b. $\sqrt{\dfrac{49}{4x^2}}$

    c. $\sqrt[3]{-8a^{21}b^6}$ d. $x^{-2}x^{-3}$

12. Exponents & Radical: Perform the indicated operation

    a. $3\sqrt{45x^3} + x\sqrt{5x}$ b. $\dfrac{\sqrt{2}}{\sqrt{6}}$

    c. $3\sqrt{8x^2 y^3} - 2x\sqrt{32 y^3}$ d. $\dfrac{\sqrt{8} - \sqrt{3}}{\sqrt{2} + \sqrt{3}}$

13. **Imaginary Numbers (i): Perform the indicated operation**

    a. $\sqrt{-24}$ b. (4 - 7i) + (2 + 3i)   c. 6i(2 − 3i)   d. $(\sqrt{5} - 5i)(\sqrt{5} + 5i)$

    e. $\dfrac{7}{4+3i}$ f. i^8 g. (7i)(-9i)   h. (6 - 2i)(3 + i)

14. **Simplify the following complex fractions.**

    a. $\dfrac{4+\dfrac{1}{x}}{3+\dfrac{2}{x^2}}$ b. $\dfrac{\left(\dfrac{y}{x}-\dfrac{x}{y}\right)}{\left(\dfrac{x+y}{xy}\right)}$ c. $\dfrac{3+\dfrac{9}{x-3}}{4+\dfrac{12}{x-3}}$ d. $\dfrac{\left(\dfrac{1}{t}-1\right)}{\left(\dfrac{1}{t}+1\right)}$

15. **Functions: Perform the indicated operation**   Let f(x) = x − 1   and let g(x) = 2x − 3

    a.   (f + g)(x)   b.   (f · g)(x)

    c.   (f − g)(x)   d. $\left(\dfrac{f}{g}\right)(x)$

16. **Functions: Find the following** Let f(x) = x^2 and let g(x) = x + 1

    a. $(f \circ g)(x)$ b. $(g \circ f)(2)$

17. **Sequence & Series: Evaluate**

    a. $\displaystyle\sum_{i=0}^{6}\dfrac{i-2}{2}$ b. $\displaystyle\sum_{i=3}^{5} 2^i$

    c.   Find the sum of the first six terms of the arithmetic sequence 2, 5, 8, 11, 14, 17…

$$S_n = \dfrac{n}{2}(a_1 + a_n)$$

    d.   Find the sum of the first six terms of the geometric sequence 5, 10, 20, 40, 80, 160…

$$S_n = \dfrac{a_1(1 - r^n)}{1 - r}$$

18. **Logarithmic & Exponential Functions: Perform the indicated operation**

    a.   Find the inverse of the given function f(x) = 6x + 11

    b.   Find the inverse of the given function f(x) = $\dfrac{13}{2}x - 4$

    c.   Solve: 4^x = 64

    d.   Solve: $3^x = \dfrac{1}{9}$

    e.   Solve: $\log_2(3x - 1) = 4$

    f.   Write the equation using logarithmic notation: 49 = 7^2

    g.   Write the equation using exponential notation: $\log_{\frac{1}{2}} 16 = -4$

    h.   Write as a single log: $\log_3 8 + \log_3 4$

    i.   Write as a sum, difference, or multiple: $\log_3 \dfrac{x^3}{x+2}$

    j.   Solve: ln (2x) = 2

19. Solve the following inequalities

    a.   x + 3 < 8

    b. $-1 \le \dfrac{2x}{3} + 5 \le 2$

    c.   2< 4 – x < 7

    d.   -2x < 6

20. Graphing Linear Equations: Perform the indicated operation

    a. Find the slope of the line containing the following points (3, 2) (8, 11)

   b. Find the equation of the line for the given points (2, 1) (-1, 4) and graph

    c. Find the equation of the line through (3, 8) and parallel to y = 4x – 2

    d. Write the equation of the following line, vertical through   (2, 6)

    e. Write the equation of the following line, horizontal through (0, 5)

    f. Find the x and y intercepts and the slope of the following equation 6x + 5y = 30

21. Which equation is represented by this graph?
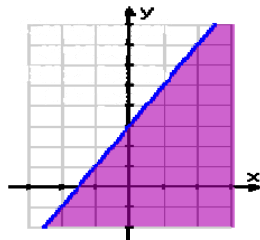
    a.   y > x – 3

    b.   y ≤ x + 3

    c.   y ≤ 2x + 3

    d.   y ≥ 2x + 3

22. Graphing Relations, Domain & Range: For the following relation: f(x) = $\sqrt{2x-5}$

    a.   State if it is a function

    b.   State the domain and range

    c.   Graph it

23. Find the Vertex, and the x-intercepts

    a.   y = -(x – 2)^2 - 3

    b.   y = x^2 + 4x – 5

    c.   y = (x + 3)^2 + 3

    d.   y = x^2 - 2x – 15

24. Identify the conic section and put in standard form

    a.   Find the equation of the circle with center (-7, 3) and radius 10

    b.   Write in standard form $x^2 + y^2 + 4x - 8y = 16$

25. Systems of Equations and Matrices: Perform the indicated operation

a. Solve the system $\begin{cases} 2y - 4 = 0 \\ x + 2y = 5 \end{cases}$

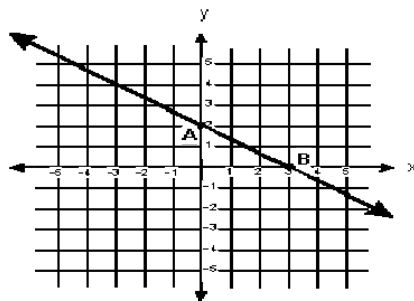b. Solve the system $\begin{cases} x + y + z = 8 \\ 2x - y - z = 10 \\ x - 2y + 3z = 22 \end{cases}$

c. Multiply $\begin{bmatrix} 1 & -1 & 1 \\ 0 & 2 & 0 \\ -2 & 1 & -3 \end{bmatrix} \begin{bmatrix} 0 & 2 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

d. Find the determinant: $\begin{vmatrix} 3 & 5 \\ -1 & 7 \end{vmatrix}$

e. Find the inverse $\begin{vmatrix} 1 & 2 \\ -1 & 2 \end{vmatrix}$

f. Perform the indicated operation: $-2\begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix} + 3\begin{bmatrix} \dfrac{1}{3} & -2 \\ 1 & 6 \end{bmatrix}$

26. Use the graph below to answer the question that follows.

Which of the following equations represents line AB?

A. $y = -\frac{2}{3}x + 2$

B. $y = \frac{3}{2}x + 3$

C. $y = -2x + 3$

D. $y = 3x + 2$

27. Use the graph below to answer the question that follows.
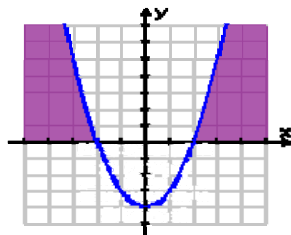
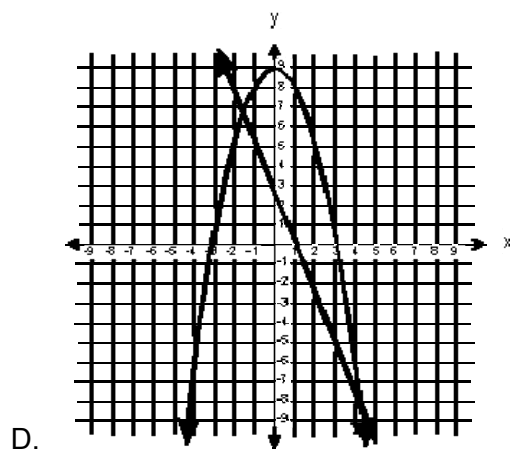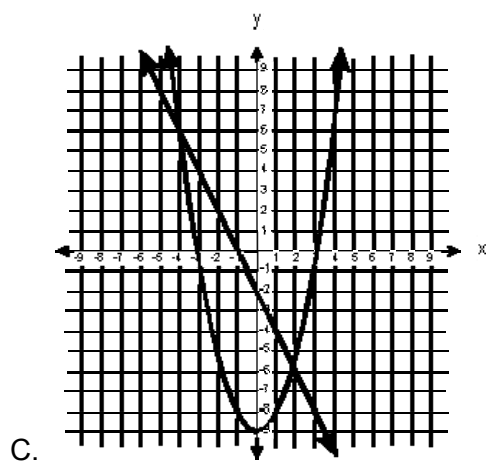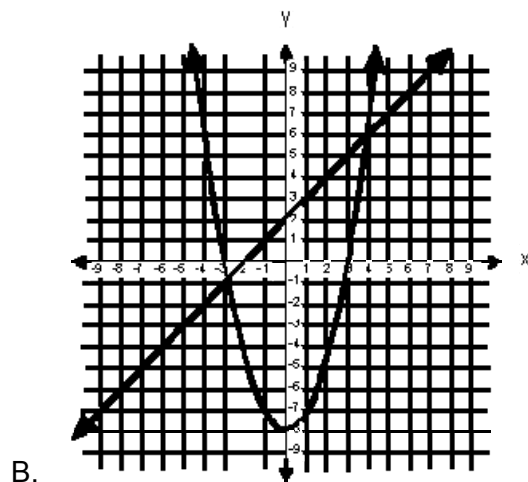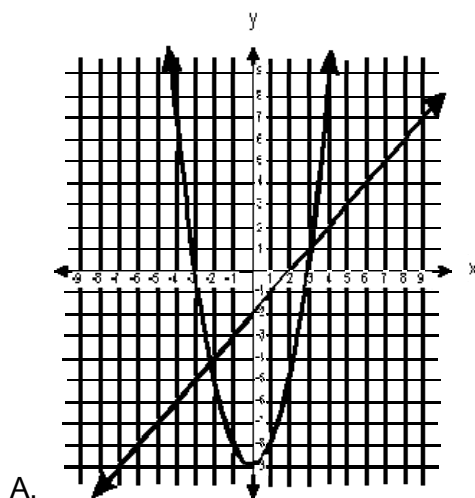Which of the following inequalities describes the shaded region?
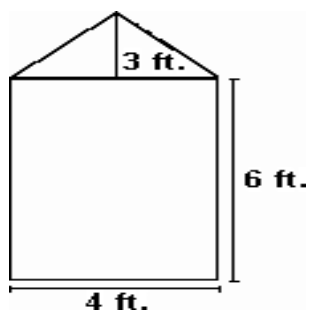
A. $y < x^2 - 4$

B. $y > -x^2 + 2x$

C. $y \le x^2 + 4$

D. $y \ge x^2 + 5x - 4$

28. Which of the following graphs shows the solution of $y + 2x + 2 = 0$ and $y = x^2 - 9$

A.

B.

C.

D.

29. Use the diagram below to answer the question that follows.

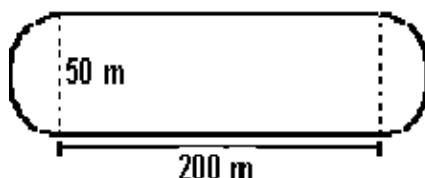A window is rectangular with a triangular top section. What is the total area of glass needed for the window?

A. 24 square feet   B. 30 square feet

C. 36 square feet   D. 48 square feet

30. **Use the diagram below to answer the question that follows**.


50 m

200 m

The drawing above represents a race track. The ends are semicircular. What is the approximate distance in meters a runner runs in 8 laps around the track?

    A. 560 m   B. 4000 m

    C. 4460 m   D. 5710 m

31. **An observatory dome is hemispherical in shape with a radius of 18 meters and is built using 12 equal sections. Which of the following formulas describes the surface area of <u>each</u> section?**

    A. $\frac{1}{12} \cdot \frac{1}{2} \cdot \frac{4}{3}\pi(18)^3$ B. $\frac{1}{12} \cdot 4\pi(18)^2$

    C. $\frac{1}{12} \cdot \frac{1}{2} \cdot 4\pi(36)^2$ D. $\frac{1}{12} \cdot \frac{1}{2} \cdot 4\pi(18)^2$

32. **Use the diagram below to answer the question that follows**.
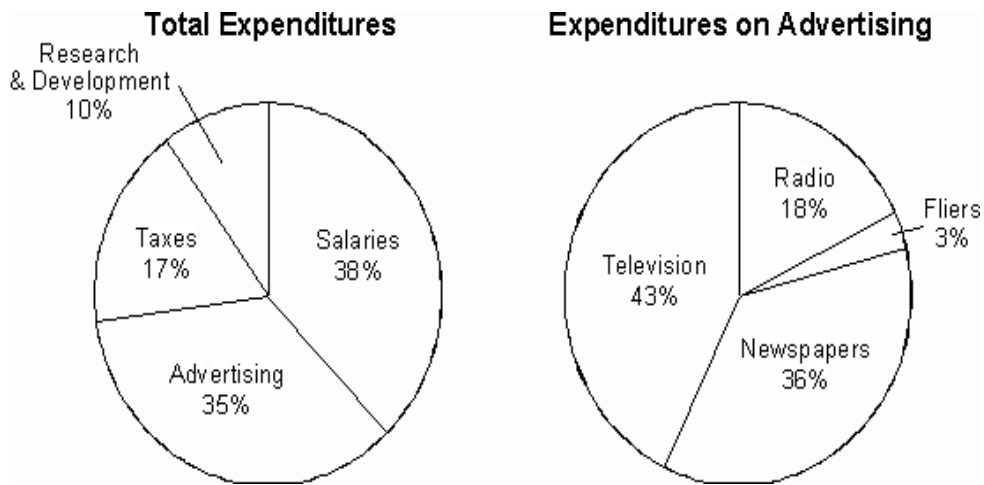

platform

12 feet

5 feet

x
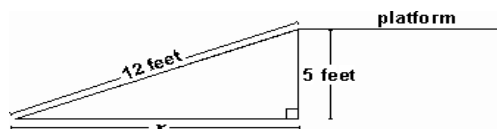
A ramp 12 feet long is leaning against a raised platform which is 5 feet above the ground. What is the distance from the ramp's contact point with the ground and   the base of the platform?

    A.   7 feet   B.   8.5 feet

    C. $\sqrt{119}$ feet   D.   13 feet

33. **Figure *ABCDE* is similar to figure *FGHIJ*. If *AE* = 5, *FJ* = 20, and *BC* = 40, what is GH?**
    A. 10   B. 25

    C. 45   D. 160

34. **If pentagon *ABCDE* is similar to pentagon *GHIDF*, and *DI* = 20, *CD* = 50, and *DE* = 45, what is *DF*?**

    A. 112.5   B. 25

    C. 18   D. 15

35.   **Use the diagram below to answer the question that follows**.

Line *AB* is parallel to line *CD*. What is the sum of the measure of angle *k* and the measure of angle *y*?

A. 90°

B. 100°

C. 180°

D. 360°

36.   **Use the diagram below to answer the question that follows.**

If △*ABD* is an equilateral triangle, and line *BD* is parallel to line *CE*, what is the measure of angle 5?

A. 60°

B. 90°

C. 120°

D. 180°

37.   **Use the diagram below to answer the question that follows**.

A rectangular box has dimensions $1\frac{1}{2}$ feet $\times$ 2 feet $\times$ 3 feet. What is the length of the longest object that can be put in the box, if the object can be placed in any position?

A. 3.6 feet

B. 3.9 feet

C. 6.5 feet

D. 15.25 feet

38. **Use the pie charts below to answer the question that follows**.

Total Expenditures

Research & Development 10%

Taxes 17%

Salaries 38%

Advertising 35%

Expenditures on Advertising

Radio 18%

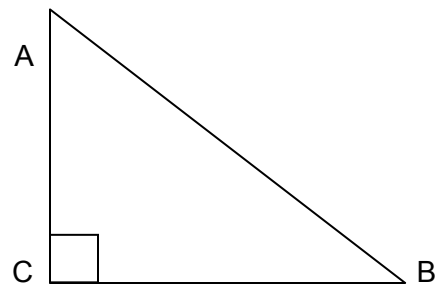Fliers 3%

Television 43%

Newspapers 36%

The first pie chart represents a company's expenditures, and the second pie chart shows a breakdown of the company's advertising expenditures. What percent of the company's expenditures is spent on radio advertising?
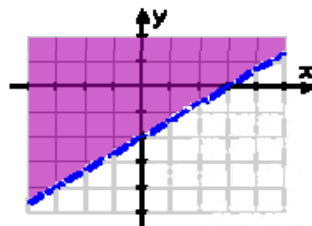
A. 6.3%   B. 11.7%

C. 18.0%   D. 35.0%

39. **The SINE of angle "B" is?**

a. $\dfrac{BC}{AC}$ b. $\dfrac{AC}{AB}$

c. $\dfrac{AB}{BC}$ d. $\dfrac{AB}{AC}$

40. **Which equation is represented by this graph?**

a. $y > x - 2$ b. $y > \dfrac{2}{3}x - 2$

c. $y \geq \dfrac{2}{3}x - 2$ d. $y \geq x + 4$

Graphing Formulas

Slope-Intercept

$$y = mx + b$$

slope   y-intercept

Point-Slope

$$y - y_1 = m(x - x_1)$$

Two-Point Formula

$$y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$$

For finding the equation of the line
{You can use this formula, when you don't
Know the slope, to find the equation of the line}

Slope-Formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

**Standard Form
of a linear equation**

$$ax + by = c$$

y-intercept $= \frac{c}{b}$ Slope $= \frac{-a}{b}$

**Standard Form of
a quadratic equation**

$$ax^2 + bx + c = 0 \quad \text{or} \quad f(x) = a(x - h)^2 + k$$

where (h,k) is the vertex

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Vertex Formula

$$x = \frac{-b}{2a}$$

Circle Formula

$$(x - h)^2 + (y - k)^2 = r^2$$

where (h,k) is the center and (x,y) is any point on the circle

Midpoint Formula

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$
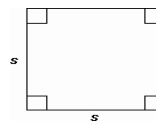
Distance Formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Geometric Figures & Formulas
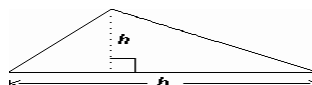
Square

Area = s^2
Perimeter = 4s

Rectangle

Area = ℓw
Perimeter = 2ℓ + 2w

Triangle

Area = $\frac{1}{2}bh$

Right triangle

Pythagorean formula: $c^2 = a^2 + b^2$
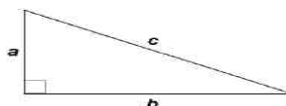
Circle

Area = πr^2
Circumference = 2πr
Diameter = 2r
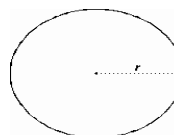
Sphere

Surface area = 4πr^2
Volume = $\frac{4}{3}\pi r^3$
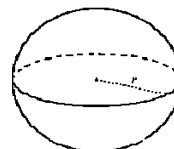
Cube

Surface area = $6s^2$
Volume = s^3
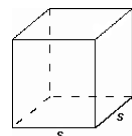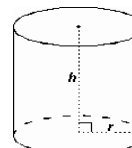
Rectangular solid

Surface area = 2ℓw + 2ℓh + 2wh
Volume = ℓwh
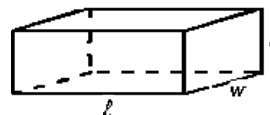
Right circular cylinder

Surface area = 2πrh + 2πr^2
Volume = $\pi r^2 h$

BASIC ALGEBRA RULES

Order of Division

$$\frac{a}{b} = a \div b = b\sqrt{a}$$

Multiplication & Division

$$(-)(+) = -$$
$$(-)(-) = +$$
$$(+) \div (-) = -$$
$$(-) \div (+) = -$$

Addition & Subtraction

$$+8 +3 = +11$$
$$-8 -3 = -11$$
$$-8 +3 = -5$$
$$+8 -3 = +5$$

Order of Operations

P   (innermost)
E   (exponents)
M & D (left $\Rightarrow$ right)
A & S (left $\Rightarrow$ right)

$a + 0 = a$	Addition by zero identity
$a + b = b + a$	Commutative property of addition
$(a + b) + c = a + (b + c)$	Associate property of addition
$a + (-a) = -a + a = 0$	Inverse property of addition
$a \times 0 = 0 \times a = 0$	Multiplication by zero identity
$a \times 1 = 1 \times a = a$	Multiplication by one identity
$a \times b = b \times a$	Commutative property of multiplication
$a \times \dfrac{1}{a} = \dfrac{a}{1} \times \dfrac{1}{a} = \dfrac{1}{1} = 1$	Multiplicative inverse (reciprocal)
$(a \times b)\, c = a\,(b \times c)$	Associate property of multiplication

Exponent Rules

$$x^3 \cdot x^2 = x^5$$

$$(x^3)^2 = x^6$$

$$\frac{x^5}{x^3} = x^2$$

$$x^{-3} = \frac{1}{x^3}$$

$$\frac{0}{a} = 0 \qquad \frac{a}{a} = 1 \qquad \frac{a}{0} = \text{undefined} \qquad \frac{a}{1} = a$$

$$\sqrt{} = ()^{\frac{1}{2}} \qquad \sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \qquad \sqrt{a \cdot b} = \sqrt{a}\,\sqrt{b} \qquad \sqrt{a^2} = \sqrt{a \cdot a} = a$$

$>$	$\circ$
$<$	$\circ$
$\geq$	$\bullet$
$\leq$	$\bullet$

X	**X²**	**X³**
1	1 x 1 = 1	1 x 1 x 1 = 1
2	2 x 2 = 4	2 x 2 x 2 = 8
3	3 x 3 = 9	3 x 3 x 3 = 27
4	4 x 4 = 16	4 x 4 x 4 = 64
5	5 x 5 = 25	5 x 5 x 5 = 125
6	6 x 6 = 36	6 x 6 x 6 = 216
7	7 x 7 = 49	7 x 7 x 7 = 343
8	8 x 8 = 64	8 x 8 x 8 = 512
9	9 x 9 = 81	9 x 9 x 9 = 729
10	10 x 10 = 100	10 x 10 x 10 = 1000
11	11 x 11 = 121	11 x 11 x 11 = 1331
12	12 x 12 = 144	12 x 12 x 12 = 1728
13	13 x 13 = 169	13 x 13 x 13 = 2197
14	14 x 14 = 196	14 x 14 x 14 = 2744
15	15 x 15 = 225	15 x 15 x 15 = 3375

1. **Factor the following Polynomials** {p. 205 #21, 31} & {p.218 #1, 3,} & {p.226 EX# 2}

   Sum of Two Cubes   Difference of Two Cubes

   $(a^3 + b^3)(a^2 - ab + b^2)$ $(a^3 - b^3)(a^2 + ab + b^2)$

   a. $2x^3(3x^2 - 4x + 1)$ b. $(x - 5)(x + 5)$ c. $(x + 3)(x^2 - 3x + 9)$
   d. $(a + 2)(b + 3)$ e. $(2x - 1)(x + 5)$ f. $(x + 3)(x + 3)$

   a. **Perform the indicated operation** {p.196 #48, 49, 63, 65, 81, 85}

   a. $4x^2 + 8y + 6$ d. $-4x^2 + 10y^2$

   b. $2x^2 + x - 36$ e. $\dfrac{x^4 b^9}{3y^6}$

   c. $9x^2 a^2 - 24xab + 16b^2$ f. $3x^3 + 9x^2 + 2x + 6 - \dfrac{2}{x - 3}$

3. **Simplify the following Expressions** { p.23 #31, 37} &{p.17 #29, 43}
   a.   48   c.   42
   b.   -2   d.   2

4. **Solve each linear equation** {p.36 #18, 23, 63} & {p.44 #13}

   a.   {-1}   c. $w = \dfrac{p - 2l}{2}$

   b.   1/6   d.   {-8}

5. **Solve each word problem** {p.48 Ex# 3, 4} & {p. 51 #3, 21} & {p.358 #49}

   distance = level distance + hilly distance

   a.   98   =   18x   +   10x

            3.5 = x

   b.   money in nickels + money in dimes = total money
            0.05x   +   0.10(20 – x)   = 1.85
                                          x = 3 {number of nickels}

   c.   x + (x + 1) + (x + 2) = 2x + 13
                        x = 10

   d. $14,000 at 8% and $10,000 at 9%

6. **Solve the following Quadratic Equations** {p.358 #1, 7, 16, 21}

   a.   {-6, 1}   b. $\{-2 - \sqrt{11},\ -2 + \sqrt{11}\}$

   c.   {-10, 2}   d. $\left\{\dfrac{-7 - \sqrt{33}}{2},\ \dfrac{-7 + \sqrt{33}}{2}\right\}$

7. **Solve the following Radical Equations** {p.326 EX#1, 3, 4, 5}
   a.   x = 42   b.   x = -9
   c.   x = 3   d.   x = 2/9

8. **Rational Expressions: Perform the indicated operation** {p.280 #47, 50, 55, 57}

   a. $\dfrac{5}{2x}$

   b. $\dfrac{x^2 - 3x + 10}{2(x+3)(x-3)}$

   c. $\dfrac{a^2 + 4a + 3}{a + 2}$

   d. $\dfrac{-a - 8}{4a(a - 2)}$

9. **Rational Expressions: Solve the following equations** {p.279#1, 13, 23, 37}
   a. x = 72
   b. x = -3
   c. x = 15
   d. x = -1

10. **Solve the following absolute value equations** {p.56 EX# 3, 4, 7, 8}
    a. {24, -20}
    b. $\varnothing$ The absolute value of any expression is never negative.
    c. {-1, 1}
    d. {3/4, 5}

11. **Exponentials & Radicals: Simplify the following expressions** {p.314 #35, 49, 64, 87}

    a. $4\sqrt{2}$
    b. $\dfrac{7}{2x}$
    c. $-2a^7b^2$
    d. $\dfrac{1}{x^5}$

12. **Exponents & Radicals: Perform the indicated operation** {p.316 #4, 28} & {p.320 #12, 62}

    a. $10x\sqrt{5x}$
    b. $\dfrac{\sqrt{3}}{3}$
    c. $-2xy\sqrt{2y}$
    d. $3\sqrt{6} - 7$

13. **Imaginary Numbers (i): Perform the indicated operation** {p.337#1, 9, 15, 18, 23, 37, 45, 49}
    Note: to simplify imaginary exponents use the chart below.

Remainder	=	Answer
0	=	1
1	=	i
2	=	-1
3	=	$-i$

    Step 1 Divide the exponent by 4
    Step 2 The remainder gives you the answer.

    a. $2i\sqrt{6}$
    b. 6 – 4i
    c. 18 + 12i
    d. 30

    e. $\dfrac{28}{25} - \dfrac{21}{25}i$
    f. 1
    g. 63
    h. 20

14. **Simplify the following complex fractions** {purplemath.com}

    a. $\dfrac{4x^2 + x}{3x^2 + 2}$
    b. $y - x$
    c. $\dfrac{3}{4}$
    d. $\dfrac{1 - t}{1 + t}$

15. **Functions: Perform the indicated operation** {p. 190 Ex# 3}
    a. 3x – 4
    b. $2x^2 - 5x + 3$

    c. -x + 2
    d. all real numbers except $x \neq \dfrac{3}{2}$

16. **Functions: Find the Following** {p.191 EX# 4}
    a. $x^2 + 2x + 1$
    b. 5

17. **Sequence & Series: Evaluate** {p.525 Ex#1} & {p.529 Ex# 1} & {p.531 EX#4}

a. $\displaystyle\sum_{i=0}^{6}\frac{i-2}{2}$ $\quad = \dfrac{0-2}{2} + \dfrac{1-2}{2} + \dfrac{2-2}{2} + \dfrac{3-2}{2} + \dfrac{4-2}{2} + \dfrac{5-2}{2} + \dfrac{6-2}{2}$

$\qquad = \ (-1) + \left(\dfrac{-1}{2}\right) + \ 0 \ + \ \dfrac{1}{2} \ + \ 1 \ + \ \dfrac{3}{2} \ + \ 2$

$\qquad = \ \dfrac{7}{2}$

b. $\displaystyle\sum_{i=3}^{5} 2^{i} \ = \quad 2^3 \ + \ 2^4 \ + \ 2^5$

$\qquad = \quad 8 \ + 16 \ + \ 32$

$\qquad = \quad 56$

c. $S_n = \dfrac{n}{2}(a_1 + a_n) = \quad \dfrac{6}{2}(2+17) = 3(19) = 57$

d. $S_n = \dfrac{a_1(1-r^n)}{1-r} = \qquad S_6 = \dfrac{5(1-2^6)}{1-2} = \dfrac{5(-63)}{-1} = 315$

18. Logarithmic & Exponential Functions: Perform the indicated operation {p.507 #7, 11, 14, 15, 26, 28, 40, 46, 54, 68}
    <u>To find the inverse</u>
    Step 1   Replace f(x) with y
    Step 2   Interchange x and y
    Step 3   Solve the equation for y

a. $f^{-1}(x) = \dfrac{x-11}{6}$ 　　b. $f^{-1}(x) = \dfrac{2(x+4)}{13}$ 　　c. $\{\ 3\}$ 　　d. $\{-2\}$ 　　e. $\left\{\dfrac{17}{3}\right\}$

f. $\log_7 49 = 2$ 　　　　g. $\dfrac{1}{2}^{-4} = 16$ 　　h. $\log_3 32$ 　　i. $3\,\log_3 x - \log_3(x+2)$ 　　j. $\left\{\dfrac{e^2}{2}\right\}$
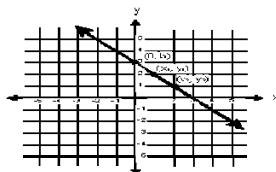
19. Solve the following inequalities {p.63 Ex#3} & {p. 69 EX#1, 2, 3}

a. $x < 5$ 　　　　b. $-9 \le x \le -\dfrac{9}{2}$ 　　　　c. $2 > x > -3$ 　　　　d. $x > -3$

20. Graphing Linear Equations {p.111 # 1,} & {p.120 #29, 34, 41}

a. $\dfrac{9}{5}$ 　　　　b. $y = -x + 3$ 　　　　　　　　c. 4x – y = 4

d. x = 2 　　　e. y = 5 　　　f. x-intercept (5, 0)   y-intercept (0, 6)   slope = $\dfrac{-6}{5}$

21.   **C.** $y \le 2x + 3$ {Taken from internet Site "Purple Math.com"}

22.   Graphing Relations: Find the Domain and Range {purplemath.com }
      a.   yes   b. Domain [2/5,∞) & Range [0, ∞)   c.
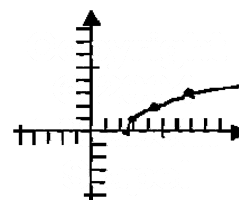
23.   Find the vertex, and the x intercepts {p.387 #6, 12, 35, 51}
      a.   vertex (2, -3) there are no x-intercepts
      b.   vertex (-2, -9) and the x-intercepts are x = -5 and x = 1
      c.   vertex (-3, 3)   there are no x-intercepts
      d.   vertex (1, -16) and the x-intercepts are x = 5 and x = -3

24.   Identify the conic section and put in standard form {p.386 EX# 7, 8}
      a.
$$(x - h)^2 + (y - k)^2 = r^2$$
$$(x + 7)^2 + (y - 3)^2 = 100$$

      b.   You must complete the square, to get the equation in standard form. $(x + 2)^2 + (y - 4)^2 = 36$

25.   Systems of Equations and Matrices: Perform the indicated operation {p.441 # 7, 21,1} & Aims Ditto

      a. $\begin{cases} 2y - 4 = 0 \\ x + 2y = 5 \end{cases}$ answer is {1, 2}   b. $\begin{cases} x + y + z = 8 \\ 2x - y - z = 10 \\ x - 2y + 3z = 22 \end{cases}$ answer is {6, -2, 4}

      c.   Multiply $\begin{bmatrix} 1 & -1 & 1 \\ 0 & 2 & 0 \\ -2 & 1 & -3 \end{bmatrix}\begin{bmatrix} 0 & 2 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ The Answer is = $\begin{bmatrix} -1 & 0 & 2 \\ 2 & 4 & 0 \\ 1 & -2 & -5 \end{bmatrix}$

      d.   Find the determinant $\begin{vmatrix} 3 & 5 \\ -1 & 7 \end{vmatrix} \rightarrow ad - bc = 3(7) - (5)(-1) = 21 + 5 = 26$

      e.   Find the inverse of $\begin{vmatrix} 1 & 2 \\ -1 & 2 \end{vmatrix}$ The Answer is = $\begin{vmatrix} \dfrac{1}{2} & \dfrac{-1}{2} \\ \dfrac{1}{4} & \dfrac{1}{4} \end{vmatrix}$

      f.   Perform the indicated operation $-2\begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix} + 3\begin{bmatrix} \dfrac{1}{3} & -2 \\ 1 & 6 \end{bmatrix}$ The Answer is = $\begin{bmatrix} -5 & -8 \\ 5 & 14 \end{bmatrix}$

26.   A
27.   C
28.   C
29.   B

30. **C.**

Step 1

Find the perimeter of the rectangle

P = 2L + 2W

↓ ↓ ↓

P = 2(200) + 2(50)

P = 400 + ~~100~~

P = 400

Step 2

Find the circumference of the circle

C = π·d

↓ ↓ ↓

C = 3.14(50)

C = 157

Step 3 (400 x 8 laps) + (157 x 8 laps)

3200 + 1256 = **4456**

Note: When finding the perimeter of composite figures you must delete the side they share from one of the equations, it you don't you'll end up counting that side twice, and your answer will be wrong. That's why, 100 was deleted from the perimeter of the rectangle. The rectangle and the circle share that side, so it was deleted from one of the formulas.

31. D
32. C
33. D
34. C
35. C
36. C

37. **B**

Step 1 This is an unusual problem to solve because you are dealing with the concept of 3-dimensions, which usually isn't covered in great detail until you reach calculus II or III. Since, we are trying to squeeze the object into the box, we are trying to find the longest diagonal line within the box.

So, to solve this problem you need to use the following formula: $D = \sqrt{x^2 + y^2 + z^2}$

You can also write your formula this way $D = \sqrt{l^2 + w^2 + h^2}$

$$D = \sqrt{x^2 + y^2 + z^2}$$

$$D = \sqrt{(2)^2 + (3)^2 + (1.5)^2}$$

$$D = \sqrt{4 + 9 + 2.25}$$

$$D = \sqrt{15.25}$$

$$D = 3.9 \text{ feet}$$

38. **A**.

Step 1
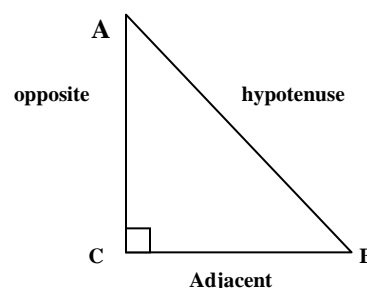
You have to find 18% of 35%, so make 35% your base.

18% of 35 is what?

$$\frac{18}{100} = \frac{a}{35}$$

a = 6.3

39. **D.** SINE = $\dfrac{opposite}{hypotenuse}$ The answer is **SINE** = $\dfrac{AC}{AB}$

40. **B.** {do not pick choice "C" the inequality sign is incorrect}

Problems taken from Math 0305 Textbook **Intermediate Algebra** by K. Elayn Martin-Gay1993, & Purplemath.com , and THEA Test

Saved C: **Accuplacer College Level Math Assessment**   Page 17 of 17