1. Solve for k: $U = \frac{1}{2}kx^2$

   (a) $U - \frac{1}{2}x^2$

   (b) $2U - x^2$

   (c) $\frac{2x^2}{U}$

   (d) $\frac{x^2}{2U}$

   (e) $\frac{2U}{x^2}$

2. The value of y that satisfies $\frac{y}{3.2} = 14$ is

   (a) 3.2

   (b) -3.8

   (c) 44.8

   (d) 17.2

   (e) 0

3. If $2x + 2y = 0$ and $2x - 2y = -4$, then

   (a) $x = 0, y = -2$

   (b) $x = -2, y = 2$

   (c) $x = 0, y = 2$

   (d) $x = -1, y = 1$

   (e) $x = 2, y = -2$

4. Solve for x: $\frac{M_1}{x^2} = \frac{M_2}{(d-x)^2}$

   (a) $\frac{-2dM_1 \pm \sqrt{4dM_1^2 + 4(M_1 - M_2)M_1d^2}}{M_2 - M_1}$

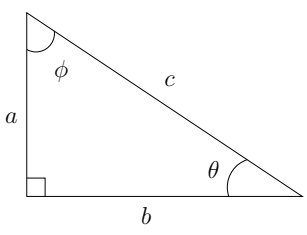
   (b) $\frac{-2dM_1 \pm \sqrt{d^2M_1^2 + 4(M_1 - M_2)M_1d^2}}{M_2 - M_1}$

   (c) $\frac{-dM_1 \pm d\sqrt{M_1M_2}}{M_2 - M_1}$

   (d) $\frac{-2dM_1 \pm \sqrt{2d^2M_1^2 + 4(M_1 - M_2)M_1d^2}}{-2(M_1 + M_2)}$

   (e) $\frac{-\left(2dM_1 \pm d\sqrt{M_1M_2}\right)}{M_1 - M_2}$

5. In the right-angled triangle shown, which is true? There may be more than one correct answer, but choose only one:



   (a) $\sin^{-1}(c/a) = \theta$

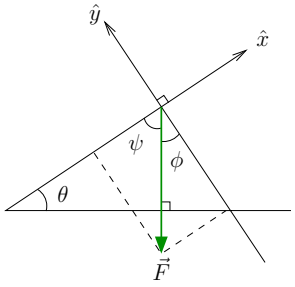
   (b) $\sin^{-1}(a/c) = \theta$

   (c) $\sin^{-1}(b/c) = \phi$

   (d) $\sin^{-1}(a/c) = \phi$

   (e) $\sin^{-1}(b/c) = \theta$

6. In the diagram below, $\theta = 30.0°$ and the vector $\vec{F}$ is 20.0 units long. Given that $\cos 30° = \sqrt{3}/2 \approx 0.866$ and $\sin 30° = 1/2$, this means that (there may be more than one correct answer, but choose only one):



   (a) F_x is 10.0 units long

   (b) F_y is 34.6 units long

   (c) F_x is 8.7 units long

   (d) F_y is 17.3 units long

   (e) F_y is 11.5 units long

7. $\frac{21(x + y^3)}{7xy}$ reduces to

   (a) $3xy^2$

   (b) $3(1 + y^2)$

   (c) $\frac{3(x + y^2)}{x}$

   (d) $3(x + y)$

   (e) $\frac{3(x + y^3)}{xy}$

8. $\frac{1}{4} + \frac{3}{5} =?$

   (a) 3/9

   (b) 3/20

   (c) 5/12

   (d) 17/20

9. If A is greater than B, and B is less than C, then we can say that:

   (a) A is greater than C

   (b) A is necessarily equal to C

   (c) A is smaller than C

   (d) there is not enough information to determine a relationship between A and C

   (e) A is not necessarily equal to C

10. If $F = mg$ and m and g are constants, then the definite integral $\int_0^h F\,dy$ is equal to

    (a) $\frac{1}{2}(mgh)^2$

    (b) mgy

    (c) mgh

    (d) $\frac{1}{2}(mg)^2$

    (e) $mgh + C$