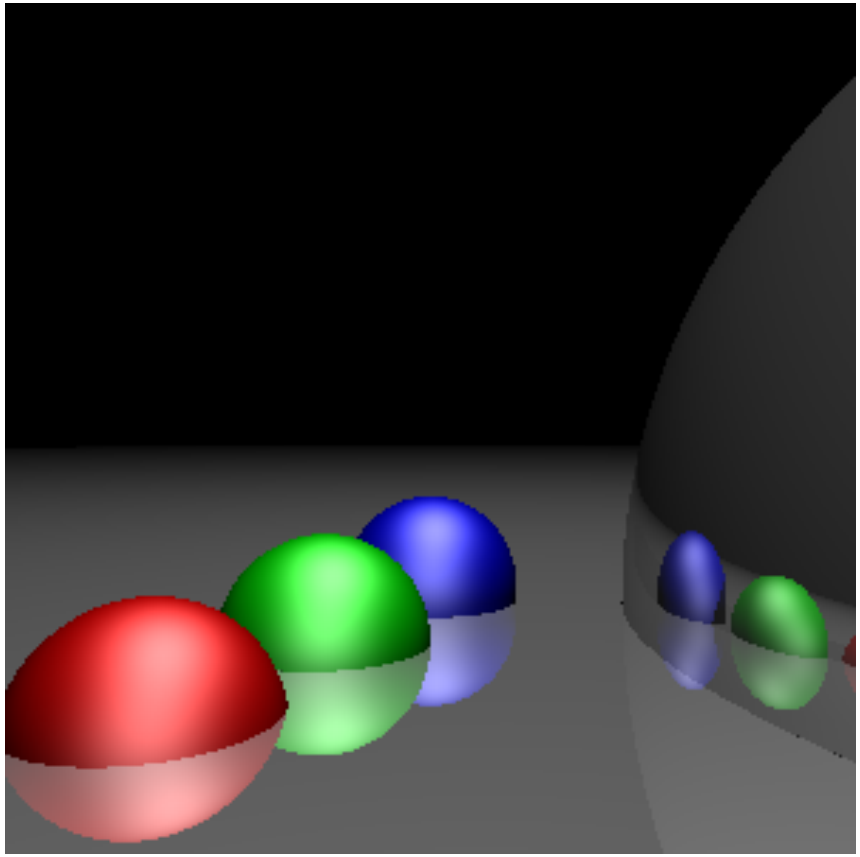


Computer Graphics

Lecture 10A

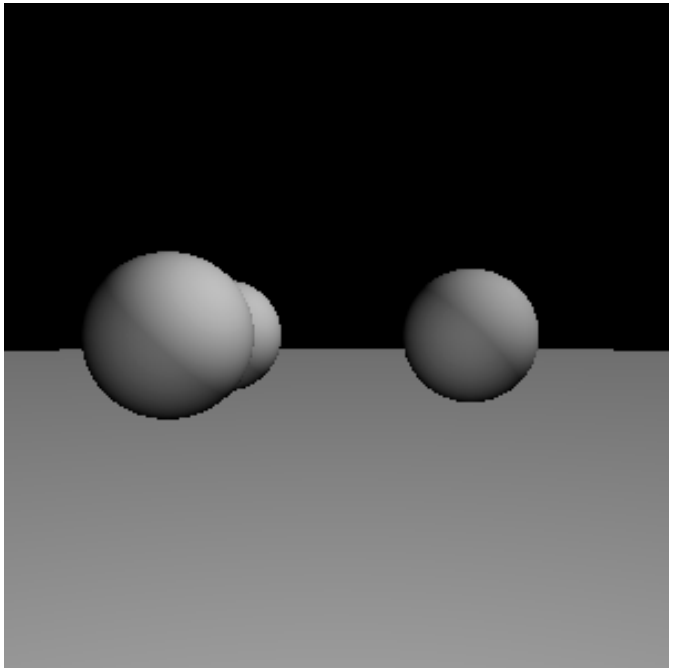
Mirror Reflection

Goals

- Be prepared to implement mirror-reflective surfaces in the ray tracing framework.

Diffuse Reflection

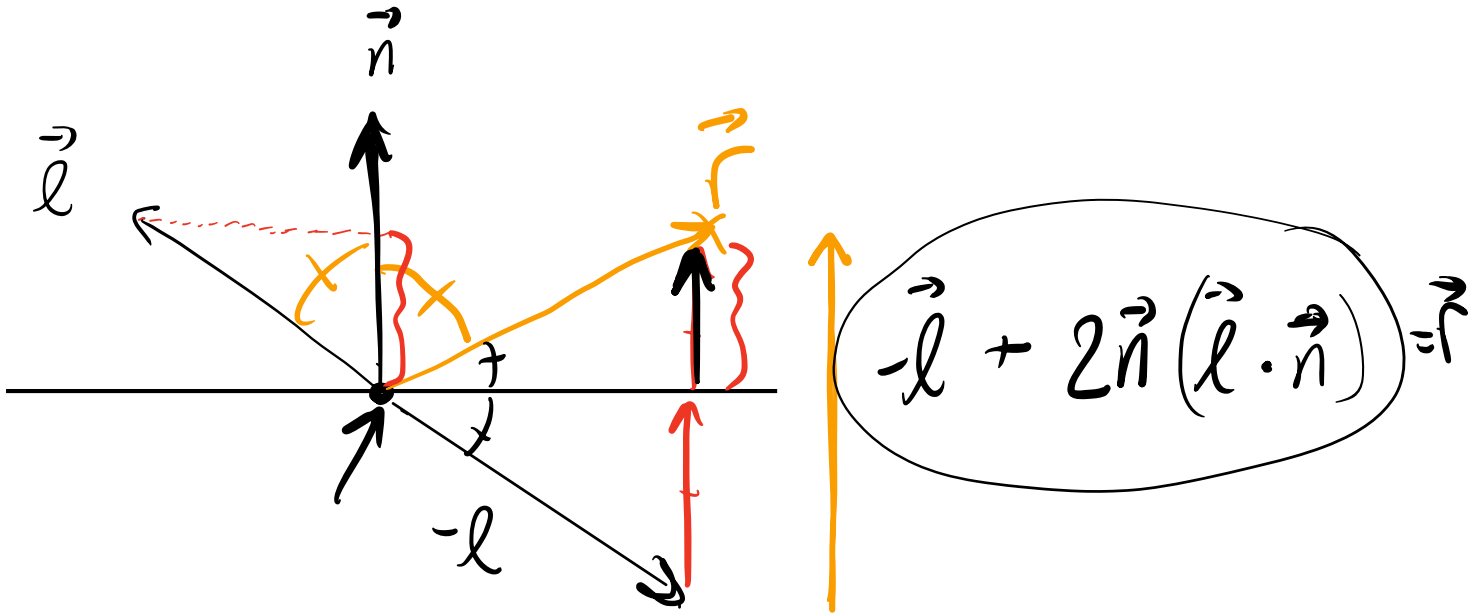
- Quite physically accurate for Lambertian surfaces
- Many surfaces are (close to) Lambertian
- Many others aren't!



Let's talk shinies.

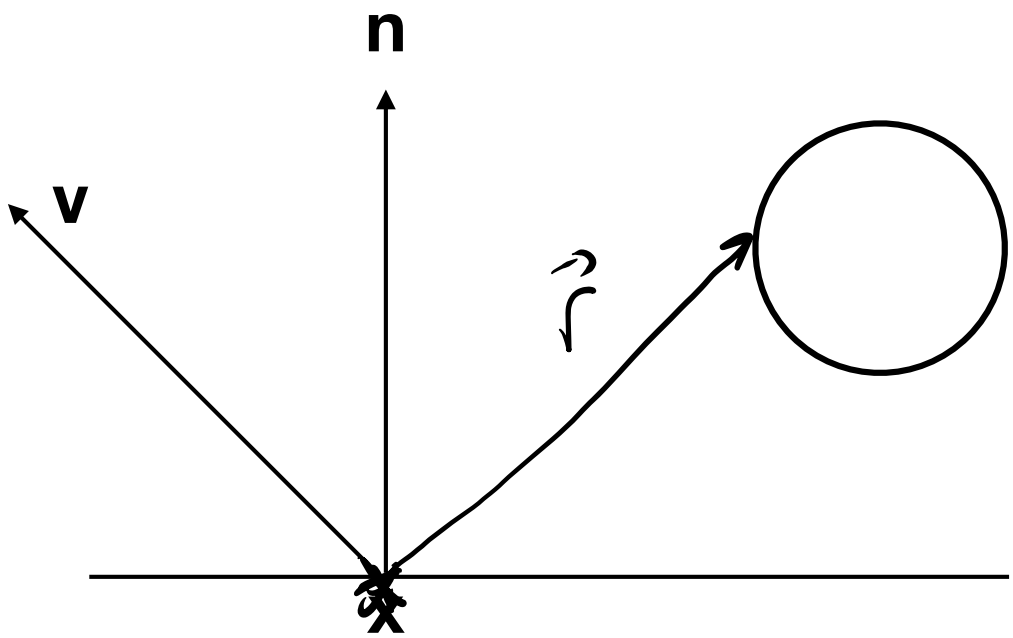
Let's talk shinies.

How does a mirror interact with light?



Mirror Reflection

What does a camera see when it looks at a mirror?



Mirror Reflection

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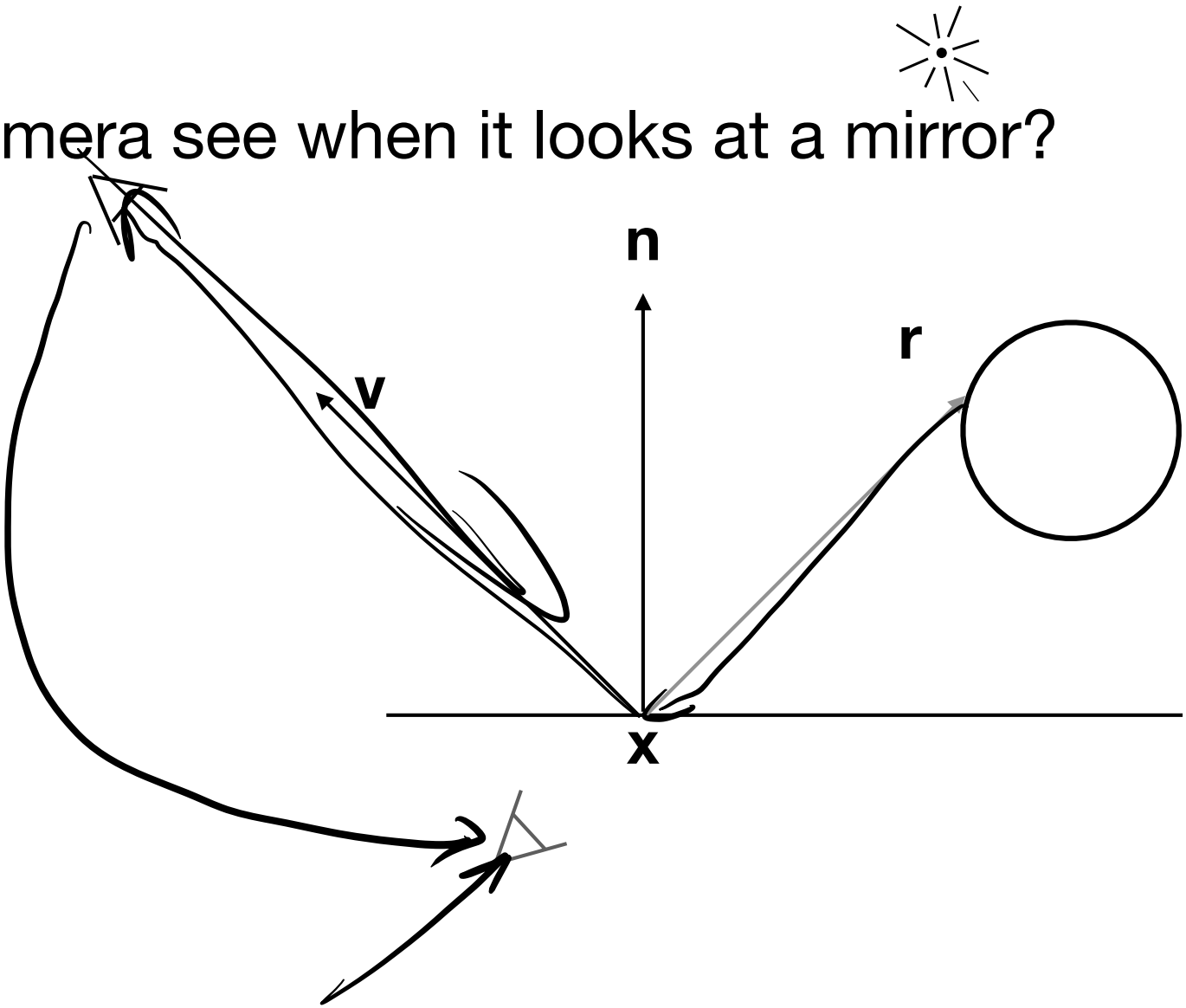

Mirror Reflection

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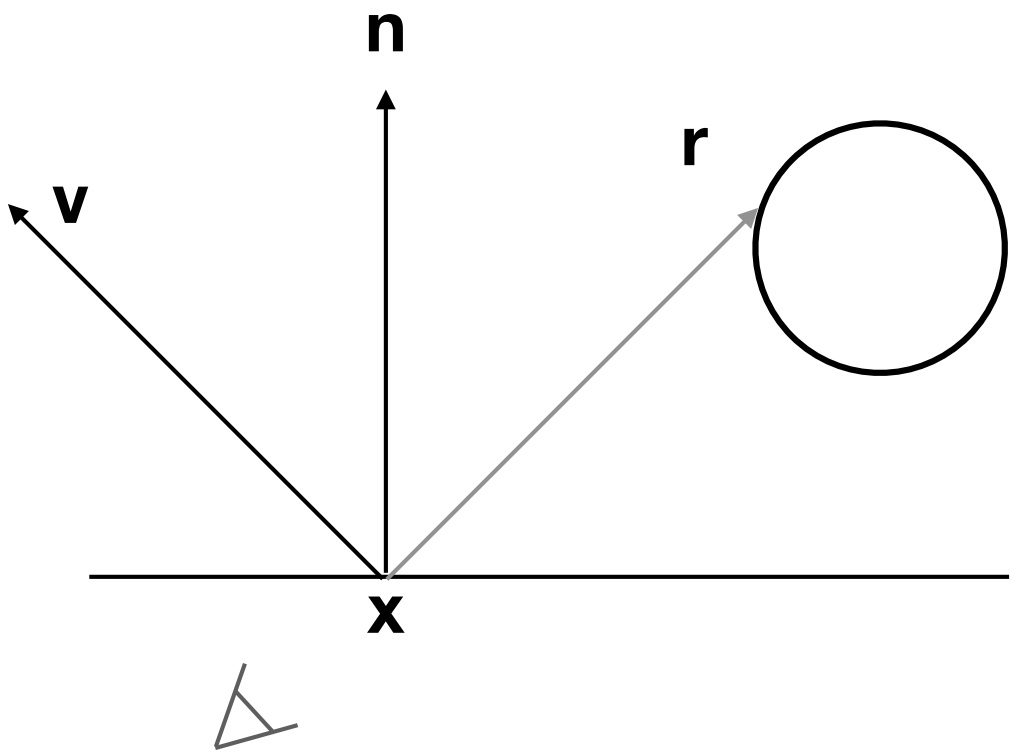
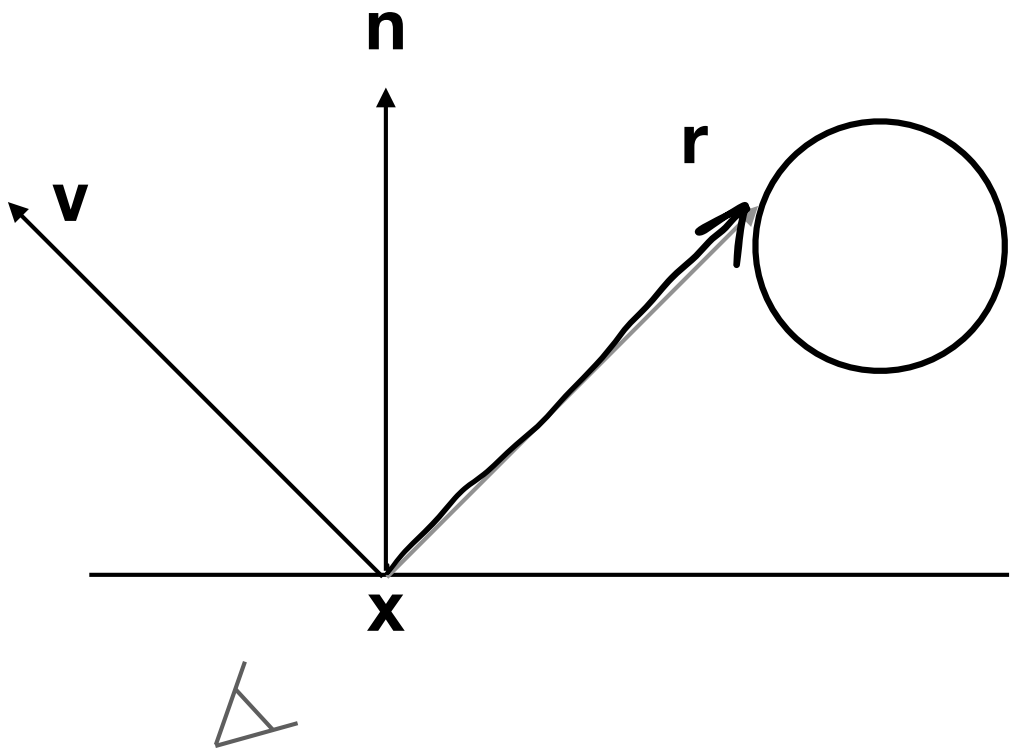


Can we do this using the tools we already have?

Mirror Reflection

What does a camera see when it looks at a mirror?



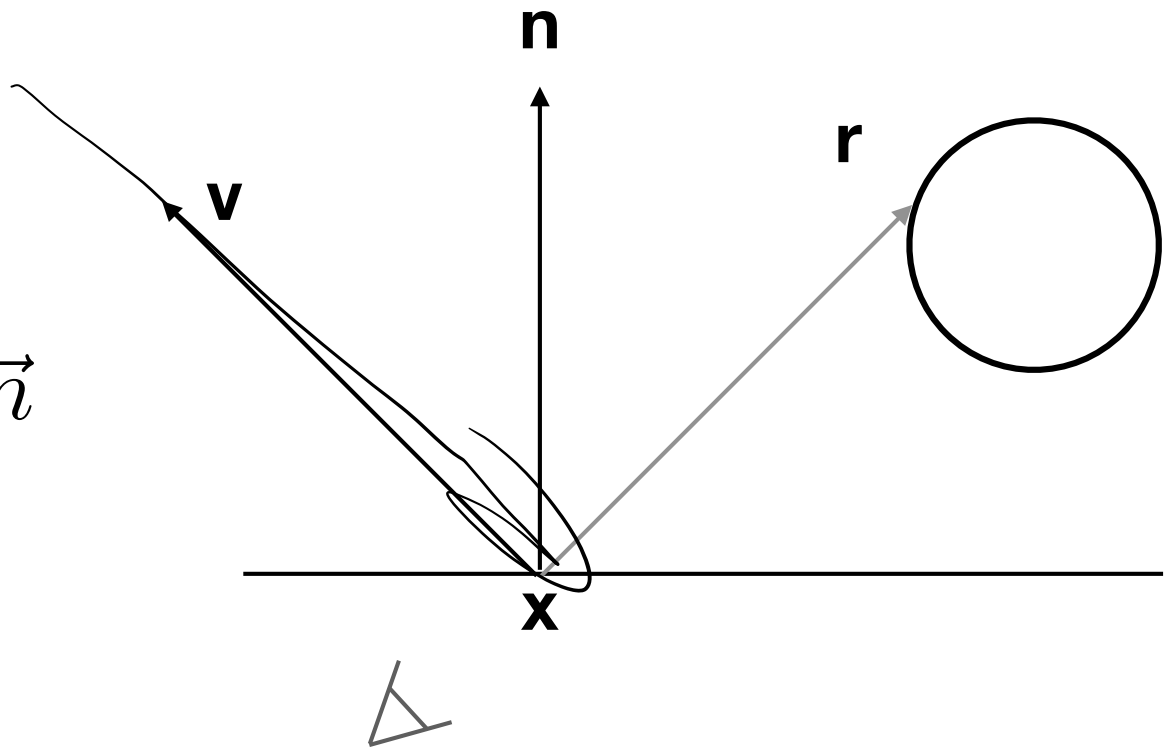
Calculate $\vec{r}$:

$$\vec{r} = -\vec{v} + 2(\vec{v} \cdot \vec{n})\vec{n}$$

```
mirr_ray.origin = x
mirr_ray.direction = r
```

Mirror Reflection

What does a camera see when it looks at a mirror?



Calculate $\vec{r}$:

$$\vec{r} = -\vec{v} + 2(\vec{v} \cdot \vec{n})\vec{n}$$

```
mirr_ray.origin = x
mirr_ray.direction = r
color = traceray(scene, mirr_ray):
```

Mirror case in `traceray`

```
function traceray(ray, scene):
    t, rec = find_intersection(ray, scene)
    if rec.obj is a mirror:
      compute r, the reflection direction
      mirror_ray = Ray(rec.x, r)
      return traceray(mirror_ray, scene)
    # other cases, ...
```